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ORIGINAL COMMUNICATIONS.

CLINICAL OBSERVATIONS.

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No. III. GRANULAR DEGENERATION OF THE KIDNEY, AND ITS RELATION TO SCROFULA:—PRIMARY AND SECONDARY TOXÆMIA.

In former papers, I have endeavoured to illustrate and enforce the practical importance of the recognition of two great facts with regard to albuminuria: 1. That, as regards the condition of the kidney, albuminuria is, *per se*, simply a sign of congestion; and 2. That as regards the blood, it is a sure indication of a poisoned condition, from non-elimination of excrementitious matter. When we find albumen in the urine, we may reckon with certainty on finding an abnormal amount of urea in the blood. Other poisons also may be present; for example, Dr. Garrod has recently found oxalic acid in the blood of a patient who had albuminuria and toxæmic symptoms during life, and whose kidneys, on dissection, were found to be in an early stage of granular degeneration.[1]

The confused association by authors of various symptoms and morbid appearances under the term "*Bright's disease*", is much to be regretted; the more especially, as the precise sense in which even some of the most esteemed employ it, can seldom be discovered. Some seem to insinuate that albuminous urine is an essential symptom of "Bright's disease": others doubt this, or assert the contrary. Some consider fatty degeneration as included under the term: and others restrict it to granular degeneration: again, times without number, we find congested or hyperæmic kidneys described as being in the first stage of "Bright's disease"; and Dr. C. J. B. Williams uses the term "congestive degeneration" as synonymous with "Bright's disease". Dropsy, it may be added, occupies a varying place in the scale of importance with the writers on "Bright's disease". I have repeatedly attended young women with sudden suppression of the menses from exposure to cold, in whom

[1] LONDON JOURNAL OF MEDICINE for July, p. 690.

there were headache, convulsions, anasarca, and albuminous urine. These cases of menstrual, secondarily complicated with renal, toxæmia, would be described by many as instances of acute "Bright's disease". In the face of so much discrepancy and confusion, is it not, therefore, unsatisfactory to use a term which most of the authors who currently employ it, shrink from defining?—a term which, from the vague ideas attached to it, obscures the meaning of authors; unless, like Dr. C. J. B. Williams, they take the precaution to state, that they employ it in a special, or restricted sense. To prevent ambiguity, therefore, and for no other reason, in the present and following papers, the term "Bright's disease" will be avoided: and the words albuminuria, granular degeneration, etc. etc., will be used simply as expressive of facts, and without any reference to theory.

By albuminuria, I mean an albuminous condition of the urine: by granular degeneration, I mean that form of cacoplastic transformation which was found in the case about to be detailed—which was seen in the case of scarlatina formerly described—and which is not an ambiguous, but a very easily recognized, change of structure. The albuminuria, *per se*, I look on, *as regards the condition of the kidney, simply as a sign of congestion: as regards the condition of the blood, as a sign of that fluid being surcharged*[1] *with urea, and possibly with other poisonous sanguineous excrements, or abnormal metamorphoses*—of which the oxalic acid, discovered by Dr. Garrod, is a most interesting illustration. Granular degeneration is a process which, if studied in all its stages, can be easily understood. It is caused by the exudation into and around the tubuli uriniferi of a cacoplastic fluid: this fluid, commonly called *inorganizable lymph*, or *cicatrix tissue* (in virtue of its inherent tendency to contract), causes the tubes to become obliterated, and the atrophy of the renal structure to proceed so far, as often to render it difficult to be seen, while the adventitious tissue conspicuously usurps its place. The sulci, which we find on the surface of granular kidneys, are caused by the contraction of the irregularly deposited cacoplastic lymph. Cirrhosis of the liver originates in the same way. Granular degeneration and cirrhosis are decidedly the result of toxæmia, causing a cacoplastic exudation from the blood: in both, the anatomical changes are effected by the contraction of that exudation.

The subject of toxæmia is so very extensive, and the space which can be afforded to any one theme in a periodical miscellany, is necessarily so limited, that it becomes imperative to treat in a fragmentary manner of topics, which, to do justice to the author and his views, ought to be discussed at length, and in immediate juxtaposition. On the present occasion, all that is proposed, is to add a little to what was formerly said in the first of this series of Clinical Contributions, with regard to scrofula and albuminuria. At p. 462, the following remarks were made: "There is a great proneness to renal congestion in scrofulous children, even when little out of their usual degree of health; this is evidenced by the frequency of albuminuria in them. I have repeatedly found the urine albuminous in the febrile attacks of strumous children: and in a case of tabes mesenterica, with dropsy, which I lately cured (by steady mild

[1] Even normal blood contains traces of urea. Dr. Garrod, etc.

purging, cod-liver oil, and syrup of the iodide of iron), the urine, at the commencement of the treatment, was intensely coagulable by heat and nitric acid. In the diseases of children of scrofulous taint, (especially when the skin is harsh and scaly), the urine ought always to be tested for albumen; and, in a large number of cases, it will be found to contain it, but will often cease to do so, on the exhibition of a smart purgative. Dangerous cerebral diseases may thus be very often averted."

That form of toxæmia, to which we give the name of scrofula, is particularly apt to cause granular degeneration of the kidneys. The simple congestion is apt to pass into that more advanced stage of disease, in which there is an exudation of cacoplastic lymph around, and often into, the tubuli uriniferi. Dr. Madden, is his "*Thoughts on Pulmonary Consumption*"—a work of no ordinary merit—in speaking of degeneration of the kidney, says: "The kidneys were found tuberculized only in about one-sixth of Louis' cases. In about a fourth of the whole number, they were redder, and of harder consistence than natural. In one case, these organs had undergone the fatty degeneration. Other observers, Dr. Christison among the number, have noticed the occurrence of granular degeneration of the kidney, during the progress of phthisis pulmonalis; and it is well known, that a scrofulous state of the constitution powerfully predisposes to that urinary disease." (p. 183.)

In assigning to the poison of scrofula, the tendency to induce granular degeneration of the kidney, it must be remembered, that it is not the only blood-disease to which this power belongs. It has already been shown, in the case of L. H. D., formerly described (p. 454), that the poison of scarlatina may originate granular degeneration of the kidney: and this will fall to be more particularly illustrated in future papers. It must also be remembered, that an accidental cause may be the first in the morbid series. For example, drinking rum or whiskey, and exposure to cold, may induce renal congestion, and, as a consequence of this, may result impaired function of the kidney. The blood then becomes imperfectly purified from its excrement, and toxæmic phenomena ensue. As the consequence of congestion, and simultaneously with the constitutional symptoms induced by it, a structural change may take place in the kidney; and this structural change, except in its first stage, can hardly be cured or arrested, though very much may be done to palliate symptoms, and prolong life.

My object in relating the following case, is to show how the toxæmia may not only induce the granular disease, but, when induced, how that structural change of the kidney may itself become a source of additional toxæmia of another kind. We shall see the original or hereditary poison inducing impaired nutrition, and a specific change in the kidney: we shall also see this change in the kidney inducing cerebral and spinal phenomena, such as ordinarily arise from non-elimination of effete matter from the blood. We shall have, therefore, a case in which one group of symptoms were caused by the primary, and another by the secondary toxæmia: and in which, the structural change in the kidney causing the secondary, was the result of the primary toxæmia.

Case of H. C. G. On the 21st September, 1846, I was hastily summoned to visit a young gentleman who, I was told, had two hours

previously appeared to be in his usual health, though apparently dying when the messenger left him—in twenty minutes from which time I arrived: the patient was then dead. The mouth was distorted, and the lips quivered convulsively: but there was neither breath nor pulse. I was told that on the previous day (Sunday) he had attended church, and that on the morning of the day of his death, he had appeared to be in his usual state of health. Between eight and nine o'clock, when engaged with his tutor, he became very unwell, and was seized with vomiting. Under the impression that the illness was a "bilious attack", he was made to rest on a sofa, and a dose of four grains of ipecacuanha was administered—as the emetic effects of this medicine had relieved him on former occasions, when he seemed to be similarly affected. He was not, at first, worse than he had often been before; and it was not till an attack of convulsions supervened, that alarm was taken, and that I was sent for: it had been ushered in by a drowsy condition, very naturally ascribed to exhaustion from the vomiting. The illness terminated in death at 11 A.M., within three hours from the first symptoms which he exhibited of being out of his ordinary degree of health. I never saw the patient in life: but Mr. Cooper, of Brentford, his ordinary medical attendant, informed me, that though always weak and ailing a little, yet he had never attended him for any definite or severe symptoms. A coroner's inquest was summoned, and, in accordance with the evidence adduced, the verdict was to the effect that the deceased had died from natural causes. The coroner did not conceive himself justified in putting the county to the expense of an anatomical examination; but the connexions of the diseased wishing to ascertain the cause of death, requested Mr. Cooper and me, to dissect the body: which we did with great care. The following is a copy of the report which we delivered to the relatives.

NOTES OF THE APPEARANCES FOUND ON EXAMINING THE BODY, seventy-two hours after death, on September 24th, 1846.

External Appearance. The surface of the body evinced the following marks of putrefaction:—the face and neck were enormously swelled; the hair was scarcely adherent to the scalp; and the integument was of a mixed green and purple colour, of varied intensity, from the head to the hips; below this, there were large livid patches, mixed with portions exhibiting the ordinary appearances of a recently dead body. From the nose was issuing profusely a fœtid and frothy discharge, which seemed to consist of decomposed blood and *pus*—possibly *mucus*. The cavities of the chest and abdomen were greatly distended with gas. The head was observed to be large, and unsymmetrical.

Head. The encephalon generally was soft; the firmest parts were the optic thalami and the pons Varolii. The vessels were greatly distended with blood;—part of this distension, however, being evidently caused by the gases evolved from the contained decomposing blood. The lateral ventricles were distended to more than twice their natural volume by serous fluid. Within the sac of the arachnoid, there was a large quantity of fluid. The brain was carefully searched for an abscess, but no trace of pus, nor any abnormal cavity, could be found. The petrous portion of the right temporal bone, when struck with the back of the knife, yielded a hollow sound. This was especially noticed,

by contrasting it with the sound elicited on striking, in the same way, the corresponding part on the left side. The petrous portion of the right temporal bone was also obviously larger than its fellow. The saw cut through it with unnatural ease; and in some parts it yielded to the knife. The bony ridges on the internal surface of the cranium were generally unusually sharp, and in some parts of the anterior of the base, their spiculated feeling was very striking.

Chest. After two ligatures had been applied around the great vessels, the lungs and heart were removed. The lungs filled the whole cavity of the chest, and were in no part adherent to the parietes. The left pulmonary pleura presented posteriorly some loosely adherent flocculi of lymph. Both lungs were gorged with blood, and when cut into, had a solid aspect, and feeling. In one or two parts, there was a crackling elicited by pressure, depending obviously on the gaseous products of the decomposed blood. The heart was quite empty, of a pale and flaccid fibre, and offered very little resistance when torn. The cavities of both pleuræ contained bloody serum. The quantity we estimated at above a pint.

Abdomen. The stomach was empty. The stomach and intestines appeared to be natural. The liver was twice the normal size: it was soft and friable throughout; the left lobe was pale and waxy; the right seemed to be pretty much in the same condition, but was dark in colour, from sanguineous engorgement. The gall-bladder contained a considerable quantity of apparently healthy bile, which by moderate pressure was made to flow into the duodenum. The left kidney had a hard, rough, and granular texture, which when cut into, presented a dirty white appearance. The examination of the right kidney was accidentally omitted.

The Conclusions to be drawn from the history and post-mortem appearances are:

1st. The granular degeneration of the kidney was the result of the scrofula-poison in the blood.

2nd. The granular degeneration of the kidney impeded normal sanguineous depuration by that organ, and thereby occasioned secondary toxæmia, from accumulation of excrementitious matter within the blood.

3rd. A sudden increase of this secondary toxæmia was the proximate cause of death.

4th. The cerebral disease, indicated by symptoms during life, and by lesions found on dissection, was caused partly by the primary, *i. e.*, the scrofulous toxæmia, and partly by the secondary, *i. e.*, the renal toxæmia.

In a subsequent paper, evidence will be given of renal toxæmia proving rapidly fatal by hydrocephalus, coma, and convulsions, before there was time for any structural change to take place in the kidney—at least before anything except sanguineous engorgement could be discovered, upon the most careful examination.

Essex House, Putney, July 1849.

ON COMPOUND FRACTURE OF THE CRANIUM, WITH DEPRESSION.

By JOHN CHARLES HALL, M.D., Fellow of the Royal College of Physicians of Edinburgh, Member of the Royal College of Surgeons of England, etc.

A SIMPLE record of facts in a concise and accessible form, unencumbered by hypothesis, has ever appeared to me the most valuable contribution that it is in the power of any medical man to make to the profession. The author of such a record contributes that which has a fixed and certain value, provided it be a correct, clear, and truthful description of what he has seen. Thus are supplied a number of important facts, which every physician and surgeon can study at his leisure, and reflect on for himself; and from which he may acquire a knowledge of phenomena, and of their relation to each other, almost in the same manner as if he had, at the bed-side of each patient, observed the symptoms, and noted the results for himself.

Medical hypotheses, and abstract general principles, form but precarious guides at the bed-side; and our practice, to be rational, and at the same time useful, must be grounded upon an extensive and correct knowledge of the natural history and pathology of diseases. The experience of any individual, however extensive his private and public practice—however prolonged his facilities for observation, is, after all, but limited and insufficient; and therefore, it is only upon a large number of facts, contributed by many observers, that legitimate principles, in medical science, can be founded. To assist, however humbly, in such a work, the following bed-side sketches have been written.

CASE I. When I was a student in Paris, a man, ætat. 28, was admitted into the Hôtel-Dieu, under the care of M. Roux; he had received a blow upon the head, cutting through the scalp, and fracturing the frontal bone, which exhibited very considerable depression. He was at first insensible; but shortly recovered sufficiently to walk to the hospital. He complained of pain in the head, which he asked to have dressed, in order that he might return to his employment; he was, however, desired to remain in the hospital, which he did for some weeks. He was only bled once, and kept upon a very low diet. The man never had a bad symptom, and perfectly recovered.

CASE II. Master W., a little boy, ætat. 10, in passing through the streets of Kensington, remained a short time to look at some men who were playing at quoits. One of the quoits struck him upon the left temple with considerable violence; he was immediately taken home, in a state of insensibility, and put to bed. When I saw him, with Mr. Carrick and Mr. R. J. Pollock, of Kensington, about half an hour after the infliction of the blow, he was cold and shivering; he was, however, quite sensible, and complained of sickness and pain in the head. Shortly afterwards, the contents of the stomach were ejected: the vomiting continued during the night. There was a large open wound of the scalp; and, on washing away the coagulated blood, a fracture, with considerable depression, was easily detected. The wound in the integuments was carefully brought together, and cold water was con-

stantly applied to the part, and to the head generally, which was shaved. Sumat hydrarg. chloridi gr. iv, statim.

18th, 8 A.M. Has passed a very restless night; complains of very great thirst; is constantly sick, and has great pain in the head; the skin is hot and dry; the tongue dry; pulse 120. To be bled to ʒviii, and to have ice applied to the head. ℞. Sodæ sesquicarbonatis, ℈i; syrupi aurantii, ʒi; aquæ, ʒx. Misce; fiat haustus, cum cochleari medio succi limonis 3tiâ quâque horâ sumendus. *Evening.* The sickness is much abated. To take four grains of calomel at bed-time.

19th. Much the same.

20th. Complains of pain in the head; skin hot and dry; urine scanty and high-coloured; great thirst; looks towards the light with difficulty; has been very restless during the night; constantly complains of thirst. To take an aperient draught every four hours, until the bowels act freely, and to have four grains of calomel at bed-time.

21st. The bowels have been well opened; pulse 106; complains of a good deal of pain in the head; skin hot and dry; urine scanty. Continue the aperient mixture, and the calomel at bed-time, as before.

22nd. The pain in the head is evidently on the increase, and the wound in the scalp, which had been closed with adhesive plaster, looks puffy round the edges. There is considerable tenderness of the scalp, and great intolerance of light. A few punctures were made in the scalp by Mr. Pollock with a lancet, and a poultice ordered over the seat of the injury. Venesection to ʒvi. Continue the aperient mixture as before.

23rd. The skin is still hot and dry; pulse 100. There is intolerance of light, and some slight confusion of thought. Apply six leeches to the temple; six grains of calomel to be taken at bed-time, and an aperient draught in the morning.

24th. Has passed a good night; bowels have been largely evacuated. The wound looks much more healthy. The boy is cheerful, and wishes to have something to eat.

It would be tedious to detail the subsequent daily course of this case. He day by day continued to improve, and eventually recovered; nor had he, when I again saw him, several years after the accident, experienced any inconvenience from the injury. A considerable depression still remained.

I have seldom seen a more severe injury than this. The fracture extended from the edge of the frontal to the squamous portion of the temporal, and thence to the left parietal bone. The wound in the integuments was more than two inches in length; the scalp was much bruised, and the periosteum in several parts separated from the cranium; the depressed portion of bone was, at least, one inch and a half in length, and was driven below the level of the cranium more than the eighth of an inch. So evident was it, that a woman, who was standing by at the time the wound was dressed, remarked, that "the boy's head was driven in." The treatment, as above stated, was confined to cleansing the scalp, and, after shaving off the hair, very carefully bringing the edges of the wound together, and affording a slight degree of support with a bandage. The experienced surgeons who saw the case (Messrs. Carrick and Pollock), were fully alive to the importance of thus carefully closing

the wound, and excluding every particle of air; and the indications for subduing the inflammatory symptoms were promptly attended to as they arose. The boy was never left for more than a few hours without the superintendence of a medical man; a most important point in these cases, as a few hours may make the greatest possible difference in the treatment required. I ought to have stated, that the boy lost a large quantity of blood from a branch of the temporal artery, which was wounded at the time of the accident.

Case III. A little boy was admitted into the University College Hospital, London, under the care of the late Mr. S. Cooper, for an injury of the head, received five weeks before. There was a fracture of the frontal bone, with considerable depression, and a wound leading down to it. The accident had been occasioned by a blow from the handle of a pump. As the boy was sensible, he was only bled and purged, and sent to bed. An antiphlogistic diet was strictly enjoined, and the head kept constantly cool with an evaporating lotion. No serious indisposition came on, and the lad soon got well, although a considerable depression remained. Mr. Cooper remarks, "I have seen many cases of depressed bone, with a wound of the scalp, do well without the use of the trephine."

Case IV. A little boy named Lee, between four and five years of age, was playing in Tattersall's yard, Grosvenor-place, when the shaft of a phaeton fell upon his head, and the iron projection on the underside of the shaft, to which the harness is fastened, made an indentation in the child's head, dividing the scalp, and driving down the bone for more than a quarter of an inch. The little boy was stunned for a short time only; he then vomited, and in a few hours appeared in his ordinary state of health. The case was seen by Mr. Lane, of Grosvenor-place. Nothing worthy of record was done for the child; symptoms were anxiously watched for, but none appeared. A piece of bone, larger than a sixpence, exfoliated; and after the wound had healed, a considerable depression remained.

Case V. George Ridley, an assistant groom in the stable of the late Earl Spencer, in removing some dung, was kicked upon the head. I saw the poor fellow, shortly after the injury had been received, in consultation with the late Mr. Wright, of Bawtry. There was a small wound upon the side of the head, about the size of a shilling, from which there was a considerable flow of blood. It was evident the wound had been caused by the heel of the shoe, which upon examination was found to be raised (or what the blacksmith terms "turned up"). This portion of iron had been driven through the scalp, with sufficient force to fracture the frontal bone; and the finger very readily detected the depressed portion. The man was stupid, and complained of feeling sick; the pulse was weak, and the hands and feet cold. The wound was washed, and carefully closed with adhesive plaster; the head was shaved, and the man sent to bed. In a few hours he complained of very great pain in his head; the skin was hot; pulse 100; he had been very sick. To be bled to ʒviij; cold water to be applied to the head; two grains of calomel to be given every six hours.

7th. The pain in the head is very severe. To have saline aperients; and evaporating lotions to be applied to the head. The bowels

have been well opened. *Evening.* He still complains of a good deal of pain in the head; the countenance is anxious; skin hot and dry; urine scanty; pulse 120. To be bled to ʒx. Hâc nocte sumat pulv. scammon. gr. iv, cum hydrargyri chloridi gr. iv. Mane sumat haustum sennæ compositum. Ice to be applied to the head.

8th. The pupils are dilated; and there is intolerance of light; great pain in the head; hot dry skin; great thirst; pulse 120. He has been restless during the night; the wound in the integuments looks tolerably healthy. To be bled to ʒxvi, and to have saline aperients with tartar emetic. *Evening.* The blood drawn in the morning is much buffed and cupped. He says he has much less pain in his head since the bleeding. To continue the saline mixture with tartar emetic, and to have five grains of calomel at bed-time.

9th. Has less pain in the head; there is some puffiness in the scalp, which was punctured in two or three places, and a poultice was ordered to be applied to it. Pulse 110.

10th. The pain in the head is extending to the right ear; there is less puffiness of the scalp. Pulse 100, still full and hard. To be bled to ʒxii.

11th. His mouth is a good deal affected by the calomel; he has much less pain in the head. Pulse 96; skin moist; urine much more abundant. This man was kept in bed, and very carefully watched for more than six weeks. He entirely recovered; a depression being very distinguishable over the part where the bone had been fractured.

Case vi. Mr. P., at the age of 16, whilst riding down a steep hill, was thrown from his horse, and fell with very great violence on his head. When taken up, he was quite insensible; and a severe wound of the head was found to have been received. The surgeons called in, on examining the injury, found that the scalp had been divided over the right parietal eminence, and the bone below fractured. There was considerable depression. According to the admitted principles of surgery in those days, the scalp was divided on either side of the wound, and the fracture followed to its terminations with the most laboured care. What was next to be done, in a case like this, of compound fracture with depression, and symptoms of pressure upon the brain? The trephine must be used; and preparations were accordingly made for performing the operation, which, however, was happily put a stop to by the gentleman suddenly recovering his senses, and by the removal of all symptoms of concussion and compression. The question now arose, whether it were safe to leave the patient in his present condition, without elevating the depressed portion of bone? This was very quickly decided by the patient himself, who declared that no operation should be performed. He was therefore removed to his bed, and the wound allowed to heal; and, notwithstanding the additional scalping of the surgeons, it did so without any untoward symptom. Forty years have rolled away since the accident: the gentleman is now alive, and when I last saw him he had a depression of the right parietal bone, of about a quarter of an inch in depth, and an inch and a half long. He has never suffered any pain or inconvenience from it, and is the father of a numerous and healthy family: one of whom is in extensive practice as a surgeon, and drew my attention to his father's head.

Case vii. July 1843. I was requested by my friend Mr. Raynes, a surgeon residing at Gringley-on-the-Hill, Nottinghamshire, to visit A. B. Two days before I saw him, a friend heated with wine had quarrelled with him, and unfortunately, in a fit of passion, had struck A. B. over the left parietal bone with a hammer, cutting through the scalp and causing a fracture with considerable depression, extending for more than an inch. Symptoms of inflammation, of a very severe character, had to be combated by active means. The man was kept in bed, and a bladder filled with ice and salt suspended over his head, which was shaved. The wound had been very carefully brought together with isinglass plaster, before I was called in consultation. The man was bled four times largely, and calomel was exhibited so as to affect the system. He slowly recovered; and, in three months, was able to attend to his usual avocations.

Case viii. This case will show the very great importance of strictly attending to diet for a long time after the infliction of injuries of this nature. Everything which has a tendency in any way to derange the system, must, for months after fractures of the bones of the head, be avoided, or the most fatal results may take place.

Mary Burton, a little girl, æt. 13, the daughter of a small farmer, fell down in her father's yard upon the edge of a stone trough. The integuments over the right temporal bone were wounded, and the finger could easily detect a fracture with some depression. The little patient was quite sensible. The plan of treatment already detailed was adopted; and in a few weeks the child was playing about, to all appearance as well as before her fall. Six weeks after the accident, in company with some young friends, the girl partook freely of sweet cake, ripe fruit, and home-made wine. Two days after this, she was seized with rigors, followed by great pain in the head, and the integuments over the original injury were so tender, that the slightest examination produced great pain. At this period I was called in consultation, to see the case, with the usual medical attendant of the family, Mr. Jackson. After very carefully examining the head, we were induced to direct our attention more particularly to the state of the alimentary canal. The face was flushed, the skin hot and dry; the tongue was covered with a thick white coat; pulse 120; pupils dilated. There was intolerance of light, and the slightest noise seemed to increase her sufferings. An emetic of sulphate of zinc was given immediately; after which six leeches were applied to the temples, and the bowels freely emptied by repeated doses of infusion of senna and manna, a powder of calomel and rhubarb having previously been taken. A lotion of spirits of wine, with water, was kept upon the head. When the bowels were unloaded, the pain and tenderness quickly subsided; and in a few days she was much better. The skin, however, retained a yellow hue; the child was languid, and seemed to care little about play or what was passing around her. This was removed by a few doses of grey powder and rhubarb at bed-time, and a little infusion of chirayta, with carbonate of soda, twice a day. This, and a strict attention to diet and exercise, gave us the satisfaction of again seeing our little patient quite restored to health.

Case ix. James Betts, æt. 10, was endeavouring, in July 1841, to get upon a cart. He fell with his head between the cart and the wheel,

and was drawn onwards for some distance; his head acting as a wedge, and causing the wheel to be locked for some yards. The bone was *not fractured*, but the parts were much bruised. I saw him shortly after the accident; and although every care was taken, the symptoms were much more severe than in many of the cases of fracture with depression already mentioned. The scalp became tender and puffy, and nothing but early and free incisions prevented a fatal termination of the case.

Cases of a similar nature were well described many years ago by Mr. Pott. For example: a man receives a blow, as in the case of Betts, upon the head; he is perhaps stunned at the time, but soon recovers, and remains for some time apparently quite well. In a day or two he begins to feel pain in his head; he is restless; cannot sleep; he has a frequent, full, hard pulse. The countenance is flushed; the eyes red and ferrety; then he complains of nausea and rigors, followed by delirium, convulsions, or coma. If the part first injured be examined, a change is found to take place, step by step with the general symptoms already pointed out. An experienced practitioner, on looking at the wound, would describe without a question the state of the system; or the rigors and convulsions would, on the other hand, enable him to point out, even before the dressings were removed, what would be the condition of the wound. I have seen Sir B. C. Brodie do this repeatedly. If the tumid scalp be cut through, or rather if this have not been done sufficiently early, the contiguous pericranium is found separated from the bone; nor is this change confined to the pericranium only. The bone itself is altered in colour—it is of a dead white hue, and looks drier than living bone. If the bone be removed, it will be seen that the more important parts within the skull are implicated; the dura mater is found to be separated from the cranium, and often covered by lymph or puriform matter. Inflammation of the dura mater may be regarded as very rare, as a simple and idiopathic affection. The extensive experience of the late Dr. Abercrombie only furnished one case, and even that can hardly be regarded as a case of simple inflammation of the dura mater. There was pus upon this membrane, which adhered to the cranium, over a space as large as a crown-piece; and at that precise spot the membrane was ulcerated. An adventitious membrane also existed beneath the arachnoid, where it covers the brain.

I have a few more cases of Compound Fracture of the Cranium to record, which, with the observations they suggest, and the result of my own experience in the treatment of a very great number of similar cases, must be postponed to a future number of The London Journal of Medicine.

(To be continued.)

Sheffield, July, 1849.

ON THE IRRITABILITY OF THE MUSCULAR FIBRE.

By MARSHALL HALL, M.D., F.R.S.

A WELL-KNOWN physiological reviewer has often, in his various publications, kindly called my attention to the experiments and reasoning of Dr. J. Reid on "Muscular Contractility", as published in the *Edinburgh Monthly Medical Journal* in 1841, and recently reprinted in that distinguished author's *Physiological Researches*. He has, in particular, done me the same service no less than *twice* in the last number but one (No. VI) of the *British and Foreign Medico-Chirurgical Review*. At page 449 of that work, he observes: "Whilst we thus fully recognize the correctness of the facts adduced by Dr. M. Hall, and admit the value of this new means of Diagnosis (which, however, even on his own admission, is by no means constantly to be relied on), we must still express our dissent from his theoretical interpretation of these phenomena, namely, that the irritability of the muscles is derived from, or directly dependent upon, the spinal cord. Nothing can, to our minds, be more convincing than the proof afforded by Dr. J. Reid's experiments, that the muscular irritability is the proper endowment of the tissue itself, depending (like other vital properties) upon its state of nutrition, which, in its turn, is regulated, *ceteris paribus*, by the degree in which the muscle is exercised. Dr. Reid has shown that the irritability of muscles may be maintained for any length of time after the complete division of the nerves, if they be duly exercised; and he has further shown, that it may be recovered, under the same circumstances, after it has been entirely exhausted. How, then, is it possible that this property can be derived from the spinal cord? *Dr. Hall has never, so far as we are aware, attempted to explain these results, but persists in his old theory, as if they had never been presented.* It is not difficult to explain all the facts adduced by him, in accordance with the doctrine which we advocate. For it is obvious, as Dr. Reid has shown, that the continuance of the connexion between the muscles and the spinal cord, after the influence of the brain has been withdrawn, will tend to sustain the nutrition, and therefore the irritability, of the muscles, in consequence of the occasional excitation of reflex contraction in them. On the other hand, as the *irritability* is not liable to be exhausted by cerebral influence, it will tend to increase, so that contractions will be occasioned by slighter stimuli; at the very same time that the whole *power* of the muscle is undergoing diminution, in consequence of its impaired nutrition."

I have endured many a lecture from the same source; and, but for the sake of truth and that science which I cultivate, would endure them on, especially as no insincere feelings of regard towards the author of the paper in question, would also deter me from *(to me)* the ungrateful task of the critic, when it leads to expressions of dissent.

The question before us is this: On what influence does this irritability of the muscular fibre depend? I have stated that this faculty is in strict dependence on the *spinal centre*. Dr. J. Reid maintains that it is independent of this centre, and dependent on the condition of *nutrition*. The appeal must be to facts. Let us then consider, or rather, reconsider the following case.

A patient is affected with hemiplegia of the right side of two years' duration. The right arm is nearly powerless; its bulk is so reduced that its circumference is one-fourth of an inch less than that of the left, usually the smaller of the two, and its temperature is also less than that of the unaffected side. The *nutrition*, I repeat, is *impaired*. Yet the irritability of the muscular fibre, carefully *tested* by galvanism, is far greater than that of the unparalysed limb! All the argumentation in the world cannot gainsay this *fact*, witnessed very recently by many competent judges, and which is only repeated here, having been stated in my former publications. The *nutrition*, then, is greatly diminished, the *irritability* greatly augmented! Why should it be necessary to say more? But in hemiplegia, the paralysed muscles, paralysed *quoad* the cerebrum, are still in connexion with the spinal centre. Let us now consider how the case would be if, instead of this, the same muscles were paralysed *quoad* the latter. I adduce an experiment from Dr. J. Reid himself.

"Exper. II. The sciatic nerve was divided in a rabbit, and a portion of it removed. Seven weeks after the operation, the animal was killed by a dose of prussic acid, and the muscles of both posterior extremities were exposed and irritated by the direct application of the wires of a galvanic battery to the muscles. The muscles of the leg of the paralysed limb contracted very feebly, while those of the other leg were thrown into powerful contraction. The muscles of the leg of the paralysed limb were evidently much smaller, paler, and softer, than the corresponding muscles of the opposite leg."[1]

I venture to designate the former *cerebral*, the latter *spinal* paralysis. In the *first*, the irritability of the muscular fibre is *augmented;* in the *second*, it is *diminished;* in *both*, nutrition is *impaired*. What is the cause, the "fons et origo" of this difference? Can any one refuse the conclusion, that the continued influence of the spinal centre on the muscular fibre is that cause? Can any one resist *this* conclusion—that augmented irritability and diminished irritability are compatible *alike* with diminished nutrition? therefore—that irritability does not depend on, however it may be modified by—as it must undoubtedly be, *cæteris paribus*—the state of the nutrition. I now beg to adduce another of Dr. J. Reid's experiments.

"Exper. I. The sciatic nerve was divided in a rabbit, and a portion of it removed. One wire from two galvanic batteries of thirty pairs of plates, was applied over the course of the nerve, and the other wire was applied over the foot, which was kept moist, until the muscles had ceased to contract. Three days after this, a weaker battery was used, and the muscles of the limb had recovered their contractility, and contracted powerfully. The more powerful battery was used as before, until the muscles had ceased to respond to the excitation, and three days after this they had again recovered their contractility."[2]

The question is—how is this fact to be explained? In answering this question, I must briefly adduce some new views, unknown probably to Dr. J. Reid at the time this paper was penned and repenned, and unknown probably to the reviewer and to Dr. Todd, who has also attempted

[1] Researches, p. 10.

[2] Op. citat. p. 9.

to investigate this subject. When the galvanic current has once passed along the muscular fibre, that fibre is no longer in the condition in which it was previously. It is in a state or condition which I have ventured to designate the *electrogenic*, a condition *produced* by the current. This condition is such, that the repetition of that current ceases to effect any contraction in the muscle, the irritability of which is not, as Dr. J. Reid supposes, diminished, but rendered inoperative. This is seen by *reversing* the direction of the current, when the muscle contracts, as before, *instantly*. Or the same phenomenon is seen by suspending the original current for a very short interval, and repeating it without change. All this I was about to bring before the Royal Society; but it was contrived to renew the Prochaska calumny, and to get my labours black-balled there.

But to return:—I believe Dr. J. Reid's supposed diminished irritability or contractility in this experiment, was an electrogenic state. I will now adduce his third experiment.

"Exper. iii. The spinal nerves were cut across, as they lie in the lower part of the spinal canal, in four frogs, and both posterior extremities were thus insulated from their nervous connexions with the spinal cord. The muscles of one of the paralysed limbs were daily exercised by a weak galvanic battery, while the muscles of the other limb were allowed to remain quiescent. This was continued for two months, and at the end of that time, the muscles of the exercised limb retained their original size and firmness, and contracted vigorously, while those of the quiescent limb had shrunk to at least one-half of their former bulk, and presented a marked contrast with those of the exercised limb. The muscles of the quiescent limb still retained their contractility, even at the end of two months; but there can be little doubt that, from the imperfect nutrition of the muscles, and the progressing changes in their physical structure, this would in no long time have disappeared, had circumstances permitted me to prolong the experiment."

This experiment is obviously incomplete. It suggests, however, one important remark—a remark made by the author against myself—that "before we lay down a law in any of the sciences,—or, in other words, arrive at a true generalization,—it must include all the facts of the case."[1] If there be no other difference, that is, in scientific language, *cæteris paribus*, the irritability in two limbs, equally deprived of the influence of the spinal centre, as of any other, ought to be the *same*, augmented or diminished; but if *another* influence be added, it must, of course, produce its own effect. In the experiment under discussion, a new difference—a new element—is added, which does not affect the original question.

But I have another remark to make. The case is one not of physiology, but of pathology,—a fact neglected by many physiologists. In physiology, and *cæteris paribus*, the more stimulus is applied to muscles, the less their irritability; compare, for example, the state of activity with that of rest, throughout the animal kingdom. To this law Dr. J. Reid's experiment affords an exception. What is the precise nature of this exception? I would suggest its cautious repetition.

[1] Op. citat. p. 12.

Besides the influence of the spinal marrow, of nutrition, and of the electrogenic state, there are other influences which affect this irritability or contractility of the muscular fibre, which require investigation. One of these is, that of the condition of the blood in the minute and intermediate vessels in the muscular structure, subjected to the experiment. It is obviously *different* in the galvanized and ungalvanized limb, being more moved, perhaps more aërated, in the former.

In these experiments, many circumstances must be taken into account which have hitherto been overlooked. Some of these are—1, the *direction* of the current; 2, the *continuity*, or *repetition*, of the current; 3, the *change* of the current; 4, the *electrogenic effect* of the current; 5, the *force* of the current; for this may be—1, *physiological*; 2, *pathological*: it is the former, I believe, in my experiments read to the Royal Society; it is the latter, in many of those of Signor Matteucci.

The question, in all its bearings, is not a simple or easy one, or one to be fathomed by an experimenter who can, in physiology, confound the results of the pure current of a galvanic trough with those of the recurrent current of an electro-dynamic machine, as Dr. Todd has done.

Dr. J. Reid observes, p. 13, in reference to my experiments:

"1. As the muscles of the limb in which the sciatic nerve had been cut, could only be called into contraction by direct excitation of the muscular fibre, while the muscles of the limb in which the excito-motory movements were retained, could be called into contraction both by direct excitation of the muscular fibre, and also by excitation of the skin, it is obvious that the more vigorous contractions observed in the limb in which the nerve had been left entire, may have been partly dependent upon the galvanism acting as an excitant upon the skin in the one limb, and not in the other. That galvanism can act as an excitant upon the skin, and produce vigorous excito-motory movements, we have satisfied ourselves by experiment."

The reply to this is, in words quoted from me by Dr. J. Reid, at p. 12, that "the difference in the degree of irritability in the muscular fibre of the two limbs, was observable when they were entirely *separated from the animal.*"

Dr. J. Reid adds:

"Though the muscles of the posterior extremity of a frog no longer respond to the motive influence of volition, after the spinal cord has been cut across, yet if the excito-motory movements remain, these muscles, as we have satisfied ourselves by experiment, may be occasionally thrown into contraction by various causes, such as the rubbing of the skin against the surface of the vessel in which the animal is placed, when it crawls onwards by the action of its anterior extremities, while those of the limb in which the nerve has been cut remain perfectly quiescent. And if this be the case, it is obvious that these occasional muscular contractions, in the one limb, may retard, or perhaps arrest, in the muscular bundles of that limb, those physical changes which are incompatible with the manifestation of the property of muscular contractility."

It has already been proved by the fact of *augmented* irritability in the *emaciated* hemiplegic limb, that such "physical changes" are *not* "in-

compatible with the manifestation of the property of muscular irritability", as Dr. J. Reid supposes.

I will now conclude this brief note. I may be allowed some credit for forbearance when I mention, that it is eight years since the first publication of Dr. J. Reid's paper, during which time I have been goaded to a reply, and yet I have abstained, obviously not because that reply was not the easiest thing in the world. I would not write this reply, even now, if to do so did not afford me the opportunity of saying that, however I may sometimes differ from him,—and my difference is not that of a biblio-physiologist and of a pædo-critic, but of a labourer and of a veteran,—I regard Dr. John Reid as amongst the very first of the physiologists of our time and country.

P.S. I do not know that any thing I have ever published, has pledged me either for or against the Hallerian doctrine, as Dr. J. Reid seems to suppose. In nature, every motor action seems to be excited by the nerves as a medium. But galvanism may excite the muscles by penetrating, as the nerves do, their very substance. Nay, I think there is reason for believing that, whilst an electric current of great intensity acts on the nerves, and through these on the muscles, a current of low intensity acts on the muscular fibre directly. But much cautious experiment is still required to determine this question. In general, the nerve is the *excitor*, the muscle the *excited*, in all muscular movements. The *vis nervosa* and the *vis muscularis* are distinct, though they may act in unison, and probably each may be injured or destroyed without the other.

The vis nervosa may be augmented in the spinal centre. May either this in nerves or the vis muscularis undergo a similar augmentation? And, what are the distinct seat and the limit of *shock?* Is the spinal centre alone, or are the nerves and muscles also affected? The heart is involved in its effect. If shock affect the muscular irritability, and if this irritability be gradually restored, what bearing have these facts on our original question? In determining the whole question, the difference between the *irritability of the fibre*, and the *power of the mass*, must be constantly kept in mind—a precaution hitherto omitted by the gentleman whom I have quoted.

London, July 1849.

CONTRIBUTIONS TO THE PATHOLOGY AND TREATMENT OF CHOLERA.

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(Continued from page 321, April Number.)

II. MODIFICATIONS, STAGES, AND SYMPTOMS, CONSIDERED COLLECTIVELY.

Some writers on Cholera would establish a difference between cases of *endemic* and *epidemic* origin; distinguishing varieties of serous diarrhœa, attended by depression of nervous energy, feebleness of the circulation, and low animal heat, as forms of *pseudo-Cholera*. There is no foundation, however, for this distinction; cases of diarrhœal Cholera, caused by functional blood lesions, may be converted by neglect, or the employment of purgatives, into well-marked attacks of Cholera. In such, as I shall clinically illustrate, languor, lassitude, nausea, and diarrhœa, accompanied by alternating chills and heats, may precede, even for several days, the appearance of purely serous, rice-water-like stools, and the *algide stage*. During the epidemic of 1818, I frequently witnessed cases of this kind, and have good ground for belief, derived from personal observation, that between these and the endemic Cholera attacks, prevalent annually in India just before the commencement of the rainy season, and those which have proved so fearfully fatal to regiments and their followers, while marching through the southern Mahratta country, there is no real difference. The action of the causes producing them may differ in intensity; but the morbid changes effected in the constitution by their agency are the same.

General description of Cholera. The invasion of Cholera is sometimes slow and insidious; sometimes, it is sudden and rapid in its progress, overpowering the vital functions, as if the person affected had been struck down by lightning or apoplexy. The first is the more common mode of attack when the disease proceeds, as would appear, from *endemic* malarious causes, or impure and deficient food; the latter is the more frequent occurrence when it is produced by epidemic atmospheric conditions of great intensity. Premonitory diarrhœal symptoms, the indications of incipient abnormal changes in the blood, usually give warning of the first kind of attack, while little or no purging precedes the vertigo, oppressed respiration, syncope, and interrupted pulse, by which the last is characterized. Some symptoms of depression, or at least of disturbance in the nervous system, usually usher in each form of attack. The patient is sleepless, complains of languor, lassitude, and listlessness, and has indescribable sensations of oppression at the chest. These are succeeded by an expression of anxiety in the countenance, pallor of the cheeks and lips, coldness of the hands and feet, nausea, and burning pain at the pit of the stomach; to which supervene vomiting, purging, and occasional tenesmus. The pulse is found, on examination, to be generally, frequent, small, and irregular: and sometimes very slow. There is extreme constriction at the præcordia; the thirst is intense and painful; the tongue, moist and cold; and there are occasional *clonic* spasms of the muscles of the abdomen and legs. Sometimes the cold-

ness of the cutaneous surface, when the disease is slow in its progress, is followed by partial dry heat of skin, and accompanied by a sharp, rapid, and compressible pulse. With the continuance of the diarrhœa, these symptoms progressively pass into collapse; though the more usual occurrence is to find the disease progressing rapidly to collapse, without any indication of reaction in the circulating system. Where this is the case, the tormina and thirst are exasperated; the vomiting and purging increase; the eyes are deeply sunk in their orbits; the countenance becomes shrivelled and Hippocratic; the skin of the hands and feet corrugated; the forehead is covered by profuse cold sweat; the vomiting, purging, and spasms, cease; the heart is feeble and fluttering in its action; the pulse almost imperceptible; the respiration frequent and oppressed; and the patient gets more and more exhausted, tossing about the bed in a constant state of restlessness; till at length coma, stertorous breathing, and the struggles of death, close the scene.

Modifications of the Disease. All the varieties I have ever seen of this extraordinary malady, may, I think, be comprehended under the *Diarrhœal*, *Pyrexial*, and *Asphyxial* forms.

1. *Diarrhœal Modification.* In this form, the causes producing Cholera appear to have had only partial effect; and to require the contingent conditions of time and circumstances to complete those changes of the blood, which constitute the complete development of the disease. Epidemic and endemic cases of this kind are frequently met with, and will be best illustrated by examples.

Case 1. James Copper, a corporal in the Grand Arsenal, aged 39 years, emaciated and feeble—states (on admission into hospital, March 14th, 1840), that, for the last three or four days, he has had frequent purging with vomiting, which increased last night. Pulse feeble; skin dry; tongue expanded and white; epigastrium tender on pressure, and somewhat full. Four grains of calomel, with aromatic confection, and a grain and a half of opium, were given on his admission in the morning, and followed by four dozen of leeches to the epigastrium, and hot fomentations. The purging continued frequent throughout the day, the stools were like rice-water; and, by the evening, the skin was more damp or cold, the pulse feebler, the eyes sunken, and the voice scarcely audible. Pills of acetate of lead, with minute portions of opium, and brandy and water for drink, and application of heat to the body, were tried without any effect in arresting the progress of the symptoms. At midnight, his pulse was scarcely perceptible; and his respiration had become greatly oppressed. The liquor lyttæ was rubbed into the chest, and produced moderate vesication, but without any decided improvement of symptoms: the disease went on to a fatal termination, which took place on the morning of the 16th. A post-mortem inspection of the body showed that the lungs were collapsed, the cavities of the right side of the heart filled with dark fluid blood, and the *glandulæ solitariæ* of the colon prominent and enlarged. There was also some venous congestion of the substance of the brain, as met with in other more rapid Cholera cases.

The intimate connexion which appears to exist, in malarious countries, between the gastro-enteritic, dysenteric, choleroid, and febrile affections, from which Europeans suffer, is indicated by the same atonic and congestive character that leads us to infer similarity of cause and

community of origin in such cases. Where such analogy of symptoms presents itself to observation, we naturally conclude that a like series of morbid changes takes place in each variety; nor can there be much cause for doubt, that such changes commence in the blood. Common diarrhœa, dysentery, or gastro-enteritis, unconnected with blood-lesions, will not, of course, terminate in Cholera; but where the cessation of endosmotic function in the pulmonic cells, as a consequence of blood disease, takes place gradually, and is accompanied by increased exosmotic action of the mucous intestinal surface, the attack may commence with all the symptoms of common diarrhœa, and terminate, in a day or two, as a case of true Cholera. The following is a good illustration of the successive morbid changes effected in cases of this kind.

Case II. James Randall, æt. 40, seaman of the Government steamer Cleopatra (admitted into hospital, May 22, 1840)—states, that he was attacked last night with vomiting and purging, accompanied by cramps of the upper and lower extremities, but made no complaint of his ailments till this morning, when he was treated for diarrhœa, on board the receiving-ship Hastings. Countenance sunken; voice and pulse feeble; tongue covered by a white film; skin cold and damp. Acetate of lead pills were given every half-hour, along with half an ounce of brandy in warm water; his extremities were shampooed, and bottles of hot water applied to his feet; the liquor lyttæ was rubbed into the epigastrium, and a blister afterwards applied. 11 A.M. Pulse more developed. Three or four rice-water-like stools have been passed since admission. An enema of acetate of lead and tincture of opium was administered, and ordered to be repeated if the purging continued. 12 A.M. Has had three stools since last report, and is disposed to sleep. 2 P.M. Has been only purged once; the stool passed is like rice-water; pulse of better strength. 4 P.M. Bowels moved twice; stools of a pale grey colour; pulse of moderate strength, and soft; headache complained of. Two pills of ten grains of calomel, with one of ipecacuanha, and one of opium, to be given along with a warm salt water enema.

May 23. The calomel and opium pills were repeated yesterday evening at eight o'clock, soon after which time, the purging of rice-water stools recommenced. Acetate of lead pills were again given during the night, and the purging ceased. The calomel and opium pills to be repeated as yesterday. *Vespere.* Bowels moved several times since morning; stools green and mucous; headache gone. ℞ Hydrargyri cum cretâ et quinæ sulphatis aa. gr. ii; pulveris ipecac. et opii aa. gr. i. M.; fiat pilula horâ somni sumenda. Utatur balneo calido; injiciatur enema anodynum si perstet diarrhœa, vel adsint tormina intestinorum.

24th. *Mane.* Bowels once moved during the night. Continuentur medicamenta heri prescripta.

25th. A small dose of carbonate of soda with rhubarb, taken this morning, acted more severely on his bowels than might have been expected, and produced much languor, accompanied by a cold clammy moisture on the skin. He was seized towards the afternoon with convulsions, became comatose, and died during the night.

A post-mortem examination, five hours after death, revealed the usual morbid appearances observable in Cholera, viz., turgescence of the membranes of the brain, abnormal distension of the blood-vessels of its

substance, with copious serous effusion into the ventricles. The lungs were emphysematous, and there were the usual marks of congestion visible in the heart and abdominal viscera.

The following is a case of *Spasmodic Cholera*, which had scarcely any of the premonitory symptoms incident to the diarrhœal modification of this disease; but as the spasms belong properly to a stage of Cholera, they cannot well be considered as the groundwork of distinction in varieties of this disease.

Case III. March 21st, 1840. Absalom Bradley, aged 36, a private of H.M. 6th regiment, admitted at noon into hospital by Dr. Morehead. Stated he had been taken ill about nine o'clock in the morning, since which time he had vomited several times, and had passed as many as five or six stools, one of which, voided since his admission, has the appearance of rice-water. Skin of nearly natural temperature. A warm bath to be used immediately, and a pill of six grains of calomel, with 1½ grain of opium, given. A mustard cataplasm to be applied to the epigastrium. 2 P.M. One copious rice-water-like stool passed since last report; stomach still irritable. The liquor lyttæ to be well rubbed into the epigastrium, and a large blister afterwards applied. An acetate of lead enema, with tincture of opium, to be used; and pills of acetate of lead and opium to be given every half-hour, along with small quantities of brandy and water. 4 P.M. Three pills taken, two of which were vomited soon after. The acetate of lead enema, with opium, was repeated about an hour ago; since which time two scanty rice-water-like motions have been passed. Pulse and skin more natural, and cramps less troublesome. 5 P.M. One scanty stool since last report; skin covered with warm perspiration; pulse feeble; cramps have ceased. The pills to be continued every half-hour, and small quantities of warm arrowroot, with an ounce of brandy, to be given to the patient every hour, or second hour, according to the strength of the pulse. 9 P.M. Had two scanty rice-water like stools about seven o'clock, since which time there has been no recurrence of purging; pulse good. Arrowroot and brandy omitted. Pills of acetate of lead and opium to be given every third hour.

22nd. Four pills given during the night; several dark grey stools passed; little or no secretion of urine; slightly increased temperature of skin; pulse of good strength. ℞ Sulphatis quinæ, calomelanos aa. gr. vi; opii gr. i; confect. aromaticæ, q. s. ut ft. massa, in pilulas æquales tres dividenda, quarum sumat unum 4tâ quaque horâ. Sumat haustum misturæ camphoræ, ʒi ss., cum acetatis potassæ, et spiritûs ætheris nitrosi aa. ʒi. Sago, with wine, to be given thrice a-day. *Vespere.* Two scanty grey stools passed since the morning; urine scanty; stomach irritable; tongue coated; skin natural, and pulse good. ℞ Calomelanos, gr. vi; pulveris ipecac., gr. ss; opii gr. i. Fiat pilula horâ somni sumenda, et nocte, nisi dejecerit alvus, repetenda. Sumat olei ricini ʒiv cras mane.

23rd. Two light grey stools in the night; some urine passed; pulse soft and skin moist; tongue still coated. Castor oil not given. Sumat pilulam sulphatis quinæ, calomelanos, et opii, antea præscriptam tertiâ quâque horâ. Habeat haustum misturæ camphoræ, et spiritûs ætheris nitrosi. *Vespere.* Urine passed freely; pulse good, and skin natural. Capiat cras mane olei ricini ʒiv.

24th. *Vespere.* Had a good night; urine free; tongue cleaner; skin natural; several bilious yellow stools have been passed since the oil was

given in the morning. The symptoms from this date continued to amend; and the patient was discharged well on the 1st April.

The diarrhœal modifications of the disease, classed by some as *pseudo-Cholera*, can be only viewed properly as imperfectly developed forms of true Cholera, wherein the abnormal functional changes in the blood are followed, more or less suddenly, by a complete development of the symptoms which characterize the more advanced or collapsed stage of the disease. The time which may elapse from the first manifestation of diarrhœal symptoms to the period of complete development, varies according to the intensity of the Cholera poison, and the quantity and depressing effect of the diarrhœal discharges. Sometimes, flatulency and distension of the stomach and abdomen, accompanied by anxiety at the precordia, chilliness of the whole surface of the body, and by diarrhœa of yellow watery evacuations, or bilious green and serous stools, precede for many days the symptoms of collapse; the surface then becomes livid, and is bedewed by a cold unctuous sweat, attended by white rice-coloured dejections from the bowels. On other occasions, symptoms of pyrexial reaction, burning pain at the epigastrium and navel, cramps of the abdominal muscles, vomiting and purging of thin mucous fluid, and a partially hot skin, may be met with as intermediate between the diarrhœal and the asphyxial or collapsed form. Such cases constitute the febrile or gastric modification of the disease; the treatment of which, though not attended by the same amount of success as attends the earlier diarrhœal forms, is more likely to be followed by recovery than in the slowly collapsed *asphyxial* modification.

Cholera being easy of cure in its earliest stage, or diarrhœal modification, it is of great importance to ascertain, by symptoms, how far such choleroid cases differ from simple diarrhœa. Fortunately, we possess the means of doing so, by testing, in all doubtful cases, the urine; which Mr. Busk and Dr. Rostan find to be albuminous at the beginning of the attack, and for several days after. *Whenever, therefore, there exists any cause for suspicion that the diarrhœa is choleroid, and may, if neglected, end in complete development of Cholera, we should examine the urine for albumen both by the nitric acid and heat tests.*

2. *Pyrexial Modification.* In this class of cases, the cause has only in part developed itself, or been followed by temporary cessation of endosmotic function in the pulmonic cells, and partial destruction of the heat-producing process. Incomplete and sometimes successful attempts at reaction are made by the constitution, to restore to health the impeded circulation of the pulmonary capillaries; and here the burning pain at the epigastrium, and the partially hot skin, which are indications of such reaction, evidence the constitutional effort which Nature makes to anticipate, as it were, that more active secondary fever and inflammatory reaction, which, as the fourth and last stage of Cholera, succeed to symptoms of grave collapse. The following case will illustrate modifications of this kind:

Case iv. July 4, 1840. Stephen Dewer, aged 22, a seaman from one of the ships now in harbour, was attacked this morning by vomiting and purging of watery matter, accompanied by occasional spasms of the abdominal muscles; stools passed since admission have the appearance of rice-water; pulse frequent and feeble. Sumat pilulam acetatis plumbi et opii omni semi-horâ; injiciatur statim enema acetatis plumbi, gr. x;

solutæ in decocto oryzæ ʒvi, cum tincturæ opii ʒss. ℞. Liquoris lyttæ, ʒss; quo perfricetur epigastrium, et postea tegatur emplastro lyttæ amplo. *Vespere.* Five pills have been taken and the enema administered; vomiting and purging have ceased; no return of the abdominal spasms; skin of moderate temperature, and soft; pulse of better strength, and easily compressible. The blister has produced moderate vesication. Continuentur pilulæ secundâ quâque horâ. 9 o'clock, P.M. Is from time to time troubled by severe cramp of his legs; pulse somewhat full and sharp. Mittatur sanguis e brachio. After eight ounces of blood had been abstracted, the pulse became more compressible, and lost its sharpness. Continuentur pilulæ tertiâ quâque horâ.

5th July. No return of cramps since the bleeding; urine passed in moderate quantity; skin and pulse soft. Four pills taken; no return of purging. Sumat haustum effervescentem secundâ quâque horâ. Continuentur pilulæ. Small quantities of sago and wine to be given to the patient at short intervals. *Vespere.* Is quite easy; bowels have not been opened; tongue somewhat coated. ℞ Calomelanos, gr. vi; sulphatis quinæ, gr. ii; opii, gr. ss. M. fiat pilula horâ somni cum haustu effervescente sumenda.

6th. Bowels not yet opened. Sumat statim olei ricini ʒvi, ex haustu aquæ menthæ piperitæ. *Vespere.* Bowels twice moved; stools passed with griping. Repetatur pilula calomelanos et opii. Sumat cras mane olei ricini ʒiv, et tincturæ opii m. x, ex haustu aquæ menthæ piperitæ.

7th. Bowels have not again been moved; occasional cramp in his toes complained of. Capiat cras mane olei ricini ʒvi.

8th. Complains of pain at the epigastrium, increased by a deep inspiration; pulse natural. Admoveantur epigastrio hirudines l. Sumat haustum effervescentem ter die.

9th. *Vespere.* Has been much griped throughout the day; pulse and skin soft. ℞ Calomelanos gr. iii; pulveris ipecacuanhæ compositi gr. x. M. fiat pulvis horâ somni sumendus. Sumat cras mane olei ricini ʒvi.

11th. Bowels gently moved yesterday by the oil. Is complaining of slight rheumatic pain in the muscles of his right leg and left shoulder. Utatur balneo fervente horâ somni. Illinatur parti dolenti linimentum camphoratum mane nocteque.

13th. Rheumatic pain of his limbs lessened; bowels gently moved by a small dose of rhubarb and carbonate of soda, given yesterday. ℞ Pilulæ hydrargyri, gr. i ss; pulveris ipecacuanhæ, gr. i; opii, gr. ss; extracti gentianæ, gr. iij. M. fiat pilula mane nocteque sumenda. Sumat cras mane olei ricini ʒi, ex haustu aquæ menthæ piperitæ.

15th. Bowels moved several times yesterday; stools watery yellow, and passed with tenesmus; tongue clean; pulse of natural frequency. Omittantur medicamenta.

16th. Complains of pain and tenderness along the ribs of the left side, and in the cardiac region, accompanied by difficult respiration and headache. Admoveantur pectori sinistro hirudines l. ℞ Magnesiæ carbonatis, ℈i; magnesiæ sulphatis, ʒvi; tincturæ gentianæ compositæ, ʒi ss; vini colchici, ℈ii; aquæ menthæ piperitæ, ʒii ss. M. fiat haustus statim sumendus.

17th. Complains of tenderness at the upper part of the sternum, and uneasiness in the superior portion of the left chest, where the respiration is puerile, accompanied by obscure vesicular murmur; headache not lessened; pulse of natural frequency; tongue furred and deficient

in moisture; bowels gently moved by the draught. ℞ Pulveris ipecacuanhæ, ℈i; vini ipecacuanhæ, ʒiiss; aquæ fontanæ, ʒi. M. fiat haustus emeticus statim sumendus. *Vespere.* Much muco-bilious matter brought away by the emetic; uneasiness of the left chest relieved; headache continues. ℞ Hydrargyri cum cretâ, gr. iij; pulveris ipecacuanhæ compositi, gr. xii. M. fiat pulvis horâ somni sumendus.

18th. No uneasiness in the left chest; slight rheumatic tenderness of the sternum; bowels not moved during the night. Sumat statim olei ricini ʒi, ex haustu aquæ menthæ piperitæ. *Vespere.* Bowels moved several times; tenderness of the scalp at the vertex; pulse full, but soft. Admoveantur temporibus hirudines xxx.

19th. Tenderness of the scalp not lessened. ℞ Misturæ antimonialis ʒi; vini colchici, m. x; morphiæ muriatis solutionis m. xv. M. fiat haustus bis die sumendus.

20th. Tenderness of the scalp lessened. Repetatur haustus magnesiæ sulphatis et vini colchici 16mo. prescriptus. *Vespere.* Bowels moved three times; headache and tenderness of the scalp as yesterday. Mittatur sanguis e brachio ad uncias xviii. Repetatur haustus misturæ antimonialis et vini colchici 19mo. præscriptus.

21st. Passed a restless night; headache and tenderness of the scalp as yesterday. ℞ Misturæ sulphatis quinæ ʒiii; vini colchici, m. xv. M. fiat haustus ter die sumendus. Sumat horâ somni pilulam calomelanos gr. iij; pulveris ipecacuanhæ, gr. i; et morphiæ muriatis, gr. ss.

22nd. Passed a good night, and slept soundly; no headache. Sumat ter die misturam sulphatis quinæ et vini colchici antea præscriptam. Repetatur pilula calomelanos et muriat. morphiæ, ut antea.

24th. Free from complaint, and permitted to leave the hospital.

The phenomena of Cholera generally, and those which constitute its various modifications, may be considered as manifestations of the pathological conditions of the organs in various stages of the disease; which conditions, however, are developed regularly or irregularly, according to the constitution of individuals, and the particular predisposing and exciting causes of the Cholera. When reaction takes place between the stage of congestion and that of *well-developed Cholera*, as in pyrexial modifications of it, this must be viewed as a pathological condition of inflammation or fever, which, though it may not happen in the usual series of effects, must be treated accordingly The cases in which Mr. Burrel, surgeon of her Majesty's 65th regiment, employed blood-letting so successfully, during the prevalence of Indian Cholera in the year 1818, appear to have been of this kind; and the following case is a further illustration of like pyrexial modifications.

Case v. Sept. 3, 1818. William Jones, a young, healthy, European soldier, admitted into the garrison hospital, at Tannah, for a contusion of his foot. Went to sleep yesterday evening, leaving the two windows near his bed open, by which he was exposed to the night air. Awoke, sometime after midnight, with pain at the epigastrium, followed soon after by vomiting, chilliness, and cold skin; to which vertigo and purging succeeded. The head was so vertiginous, that the patient fell down several times on his way to the hospital privy; and there was a cold, clammy perspiration on his body during the whole night. Made no application for medicine till the hour of my morning visit to the hospital; when his pulse was feeble and labouring, his stomach irritable, his

skin very cold, and covered by clammy moisture. A dose of fifteen grains of calomel, and the usual draught of tincture of opium, rectified ether, and spirit of ammonia, were given, but rejected almost immediately by the stomach. The medicines were again given and retained; and the patient being then put into a hot bath, was bled from the arm to the extent of fourteen ounces. 3 P.M. The draught last given was not long retained by the stomach; epigastric tenderness and pain still complained of; pulse labouring. Sumat statim calomelanos, gr. xv; cum haustu tincturæ opii et ætheris rectificati antea præscripto. Mittatur sanguis e brachio ad uncias xii. 6 P.M. The pulse rose somewhat at first as the blood flowed from the arm, but soon after sank very low; the calomel and laudanum draught were repeated as before, and the patient put to bed, with plenty of warm covering over him, and bottles of hot water to his feet and legs. Dr. Jukes, surgeon of the garrison, had visited the hospital at 4 P.M., and ordered a blister to be applied to the epigastrium. Symptoms the same as at last report. ℞ Assafœtidæ gummi-resinæ ʒvi; sulphatis magnesiæ, ʒii; aquæ calidæ, ʒxii; tere intimatim, solve, et cola; adde liquori tincturæ opii et tincturæ castorei aa. ʒiss. M. ut fiat enema statim injiciendum. 8 P.M. Is much easier, the violent pain in his stomach and bowels having been greatly relieved by the enema; the injection of which was followed by a warm glow on the skin, and gentle perspiration. The blister has not yet produced vesication.

6th. 10 A.M. The blister has produced free vesication. Respiration more free and equable; pulse frequent and feeble; hands and feet of moderate warmth. Injiciatur statim enema assafœtidæ antea præscriptum. 6 P.M. Feels quite easy, and seems in a fair way of recovery. Skin warm and perspirable; one watery clay-coloured stool brought away by the enema.

7th-10th. Nearly well; has had one clay-coloured stool from some calomel and opiate confection, prescribed yesterday evening by Dr. Jukes. Left the hospital quite well on the 10th September.

3. *Asphyxial (or Collapsed) Modification.* In the more severe cases of this kind, there are generally no premonitory symptoms of lassitude and nervous depression, diarrhœa, or sensibly progressive congestion; but the patient is, as it were, struck by lightning, and falls down insensible, after a sudden attack of vertigo; lies with half-closed eyes, but has not altogether lost his consciousness; breathes heavily and sighs often; has an interrupted, thready, or almost imperceptible pulse, accompanied by slow action and irregular rhythm of the heart. The eyes are sunk in their sockets, and surrounded by a dark circle; the conjunctivæ are injected with blood; the lips are livid; and the extremities ice-cold and blue, accompanied by a peculiarly corrugated state of the skin, resembling the hands of a washerwoman. These symptoms may be attended by frequent choleroid evacuations from the bowels, though sometimes little or no purging precedes such attacks, and in all bears no relative ratio to the severity of the other symptoms. Sometimes this symptom is altogether absent during the prevalence of like epidemic attacks, where the presence of all the other symptoms, just enumerated, leaves no doubt of such being modifications of Cholera. Such was the case already narrated in the history of the disease in 1818.

Symptoms and Stages collectively. The characteristic symptoms of *Cholera algida*, which declare the nature of the disease, are those which

have their origin from morbid changes in the respiratory, circulating, and nervous systems; by which the voice is weakened, the inspirations rendered shallow and frequent, the respiratory murmur lessened, the action of the heart made slow and irregular, the pulse interrupted and thready, the extremities and lips livid, the exhalation from the skin and intestinal surface increased, the secretion of urine suppressed, and the animal heat diminished to a standard little short of the coldness of death. These symptoms vary in their progress and intensity, according to the original or acquired constitution of individuals; but generally come on in a certain order or progression, constituting stages of the disease: irregularities in which, or interruptions of their usual course, give rise to the several modifications I have mentioned. It is from this very irregularity, that the disease is sometimes so much more unmanageable than at others; depending, as it appears, on the greater or less intensity of the atmospheric cause, and the predisposition of individuals affected. On the first breaking out of an *epidemic Cholera*, cases of a severe type generally prevail, which become milder as the disease is disappearing. In ascertaining the value of particular remedies in the treatment, it is necessary to estimate, with precision, these conditions and circumstances; and it is of no less importance, if we would secure the probable success of such remedies, and consult the safety of particular cases, that we should not be led by a blind empiricism in our practice, but endeavour to ascertain, by an accurate discrimination of the particular modifications and stages of Cholera, what specific remedies may be applicable. A summary of the course and progress of symptoms may be conveniently arranged under FOUR STAGES: 1st, the premonitory stage of depression, or diarrhœa; 2nd, the stage of congestion, or development; 3rd, the algide stage, or that of collapse; and 4th, the well-marked stage of reaction, or consecutive fever, which is not an *essential or invariable part* of the disease, but follows as a *contingent condition of congestion* in some cases, by which the parts affected are restored to activity, and poisonous products in the blood eliminated by the secretory organs maintaining their natural functions, without yielding to a state of inflammation.

First Stage. The symptoms of this stage varied in different individuals. In some, the digestive organs were disturbed, attended by fulness of the stomach, flatulence, slight colic, dryness of the palms of the hand, yawning, and indescribable languor. In others, a sense of fulness in the stomach, accompanied by a painful sense of anxiety at the præcordium, listlessness and depression of spirits, preceded pain in the præcordial region, which was followed by diarrhœa, at first of a dark yellow colour, sometimes of a bilious green. This stage was present in the majority of Indian cases; but was not always sufficiently well marked, or of long enough duration, to be taken into account by the patients. In some, it lasted two or more days; but its period may be said to extend from the first disturbance of the digestion, and symptoms of nervous depression, to the appearance of Cholera stools, or spasms.

Second Stage. This was generally one of rigour, or chilliness. The patient's countenance had an expression of great anxiety, and was of a dusky brown hue, or livid cast. The alvine evacuations, which were in the first stage fæculent, now became like rice-water, or serous, mixed with flakes of mucus; but, in some instances, they were of a leaden, turbid

appearance. Vomiting of watery matter, similar to the dejections in colour, accompanied by epigastric pain, was generally simultaneous with the purging. As the vomiting and purging progressed, and became urgent, the cyanosis of the face, neck, and extremities, increased in proportion; the skin became extremely cold, and bedewed by clammy sweat; the voice hoarse; the pulse small, and rapid; the eyes deeply sunken; accompanied by urgent thirst, deafness, and frequent violent cramps of the legs, thighs, and arms. In the earlier part of this stage, small quantities of urine were sometimes passed; but, during its latter period, the secretion from the kidneys was altogether suppressed. The complete development of these symptoms, or a more vigorous circulating system and higher degree of nervous tone in individuals, giving rise to feeble constitutional efforts of reaction in this stage, might be said to form that modification of Cholera which I have called *pyrexial*.

Third Stage. In this stage, the discharges from the stomach and bowels became less frequent, or almost ceased; the spasms were nearly at an end; the pulse, if it had not ceased, was scarcely perceptible; the whole body was bathed in cold, clammy, perspiration; the skin of the hands and feet was icy cold, and corrugated, as if long steeped in water, though many patients could not bear the bed-clothes, and complained of burning heat of skin; there was much constriction of the thorax, accompanied by breathlessness, jactitation, and anguish; the eyes were half covered by the eye-lids; and the dying man, though still conscious, appeared almost in a state of stupor. Some degree of disorder in the respiratory, circulating, and nervous systems, seemed to precede the symptoms of the *second stage;* but in this more *intense form* of the disease, the oppressed respiration, the embarrassed and struggling heart, the loss of nervous irritability, the cessation of all secretions, and the death-like coldness of every part, indicated that all the powers of life were paralyzed, and that vital action was at its lowest ebb. The apoplectic form of the disease is but a modification of this stage, wherein the cerebral functions are at once suspended, by the amount of congestion in the head; while the impeded functions of respiration, circulation, and calorification, are more recently and suddenly affected; and are attended by less real debility than when they occur more gradually.

Fourth Stage. The symptoms, and complications of reaction, have a near relation to the conditions of the third stage; as much, indeed, as sweating, or inflammatory complication in fever, bears to the cold stage. At the period of reaction, the surface of the body became gradually warmer, the skin, from being livid, resumed its natural colour; and the perspiration returned to its healthy warm state. The vomiting, cramps, and diarrhœa ceased; and there was a stronger and fuller pulse, more equable and natural respiration, and a return of both the urinary and biliary secretions, the evacuations from the bowels being now of better consistence, and green. Sometimes, however, as in the hot stage of fever, inflammatory complications of the stomach and liver took place, during the general increased action of the circulating system, with a not unfrequent constitutional *æsthenic* tendency, to sinking of the pulse, coldness of the skin, reappearance of the vomiting, return of the Cholera evacuations, and such final prostration of the powers of life, as to terminate in death, after reaction had promised recovery.

(*To be continued.*)

BIBLIOGRAPHICAL RECORD.

PRINCIPLES OF MEDICINE: comprising General Pathology and Therapeutics, and a Brief General View of Etiology, Nosology, Semeiology, Diagnosis, Prognosis, and Hygienics. By CHARLES J. B. WILLIAMS, M.D., F.R.S. pp. 533. London: 1848.

(Continued from p. 554.*)*

HAVING completed his remarks on the Primary Elements of Disease, DR. WILLIAMS proceeds, in the Third Chapter of his work, to notice the SECONDARY or PROXIMATE ELEMENTS OF DISEASE, consisting of two or more Primary Elements. Those which have been most generally studied, are those affecting the circulation of the blood. They comprise at least three of the *primary elements*—the blood and its constituents, and the irritability and tonicity of the organs engaged in its distribution. It is also necessary to keep in mind the physical properties of the vessels and their contents, as these often have an important influence in the production of disease. The subjects of the present chapter are, *defect* and *excess of blood*, general or partial, with *increase* or *diminution* in the irritability or tone of the moving fibre.

ANÆMIA, or, more correctly, HYPÆMIA, or OLIGÆMIA, has for its predominant character a deficiency of blood. With this deficiency in quantity, there is generally associated a deterioration in quality, which led the late Dr. Simon to apply to the condition the term SPANÆMIA. The Exciting Causes of Anæmia act either by directly withdrawing the blood, or its animal constituents; or by impeding its healthy formation. To the latter class belong insufficient food, impure air, and various chronic diseases. But the most common cause is irregularity of the uterine function, inducing *chlorosis*. On the relation between irregular uterine function and chlorosis, Dr. Williams remarks that in many cases anæmia is evidently the effect; and this "is plain, from the well known fact, that no signs of anæmia have occurred until cold, over-exertion, or mental excitement, or some circumstance, has suddenly checked the flow of the catamenia; it has not returned, and then the patient begins to lose colour, and gradually to exhibit the anæmic state. In many cases I have known this occur in young females who have previously suffered from acute rheumatism, implicating the heart. It would seem that, in these cases, some injury is done to the blood particles, and to the powers by which they are repaired: this is manifest, not only from the pallidity, but from the yellowish and almost greenish hue, which the complexion sometimes presents, and which obviously depends on a discoloration of the textures by the altered blood, as in the neighbourhood of a bruised part." (p. 163.) The depraved appetite, sometimes met with in chlorosis, does not occur with sufficient frequency to be considered a cause of the anæmia.

The General Symptoms of Anæmia are those of general muscular weakness, weakness of the heart, feebleness of the circulation, organic weakness, and imperfect sanguification. The surface also exhibits physical signs of the scantiness of the blood; and the venous murmurs heard in the neck, and the aortic murmur frequently heard, give additional evidence of its thinness. When drawn, the blood is thin and watery, and forms a very small contracted clot, generally with a buffy coat. The red particles are diminished more than the fibrin; and the albumen is generally defective in quantity, except in paraplegia. Symptoms indicating irritation or exaltation of function often occur, many of which are referable to the intestinal canal. Sometimes there are more direct signs of excitement of sensibility, of the excito-motory function, or even of the mind. Dr. Williams explains the fact of the nervous system being generally excited in anæmia, by the peculiar distribution of the circulation through the nervous centres. He adopts the view, that the

quantity of blood in the head and spinal canal is subject to variation; the intra-cranial and intra-spinal vessels being unable, not being exposed to atmospheric pressure, to accommodate themselves to the reduction of the blood, and hence retaining more than their proper share. The effects vary, according to the propulsive power possessed by the heart. "Under the influence of temporary palpitation, fever, or other kind of excitement, the brain and spinal cord, through their uncontracted vessels, which are among the nearest to the heart, receive an unusual share of its exalted but partial force; an erethism of some one or more of the functions of these nervous centres is the consequence: and pain, spasm, sensorial excitement, intolerance of light and sound, or sympathetic irritations, of some kind or another, occur." (p. 166.) There may be in such cases, obvious signs of an excess of blood in the head, while the extremities and surface are bloodless, and more or less cold. Epistaxis, if it occur, may produce momentary relief, but may ultimately add considerably to the evil. "On the other hand, if the heart's action is feeble, it may be inadequate to propel the blood accumulated in the vessels of the brain; it therefore stagnates, and may cause some of the symptoms of congestion in that organ. Hence headache and giddiness, relieved by the recumbent posture, drowsiness, impaired mental faculties, obscured vision and hearing, partial paralysis, and, in extreme cases, coma or catalepsy. In such cases the blood is accumulated more in the veins and sinuses of the brain than in its arteries; and, not receiving enough force from the heart to keep it in full motion, it partially stagnates, and the functions of the corresponding parts are impaired in proportion. This congestion may be only temporary, and lead to no serious results; but in some cases I believe there occurs an event that has not been noticed by pathologists—namely, a coagulation of the blood in the sinuses, and a consequent permanent obstruction to the passage of the blood through the brain. I have met with several cases more or less corresponding with the following description. A young female becomes anæmic, and after exhibiting various symptoms of feeble general circulation, with headache, drowsiness, and impaired sensorial functions, suddenly becomes worse; passes into a state of stupor, with dilated pupils, sometimes varied by slight manifestations of delirium, throbbing of the carotids, and partial heat of the head, and dies comatose. On opening the head, a small quantity of serum is found under the arachnoid and in the ventricles, sometimes with a little lymph (in one case there was none). The vascularity of the membranes is remarkable, but the vessels most distended are the veins, and in the larger of these and in the longitudinal sinus, there is a firm coagulum. In parts, especially at the torcular Herophili, this coagulum blocks the whole sinus, and exhibits a separation of fibrin, portions of which are softened down into that opaque purilaginous matter which was long mistaken for pus, but which Mr. Gulliver has shown to be a mere disintegration of the fibrin, which mere stagnation in a warm temperature may effect. These have been taken for cases of meningitis. No doubt inflammation may supervene in them occasionally, but in two cases that have fallen under my notice, there was no adhesion of the arachnoid nor deposit upon it, nor any other unequivocal mark of inflammatory action; yet the fibrinous and bloody concretions in the veins and sinuses were most remarkable for their size and firmness. It appears to me most probable, that these affections originate in the encephalic congestion connected with anæmia. Fibrinous concretions form on the transverse bands of the sinuses, and increase until they considerably obstruct the passage of the blood: hence the impaired state of the cerebral functions, amounting at last to coma. Reaction may take place, with determination of blood, and even inflammation, and these cause those symptoms of partial excitement that sometimes exhibit themselves; but neither during life, nor on examination after death, are the proofs of excitement so prominent as those of obstruction and interruption to the cerebral functions. It must be remembered, that in anæmia the fibrin of the blood

is not diminished in proportion to the other animal contents, and it has a greater tendency to coagulate than in healthy blood." (pp. 167, 168.)

Dr. Williams next refers to the mode in which the nutrition of the textures is affected by anæmia. Emaciation is not constant; but in many cases there is a considerable amount of fat: this, however, still indicates a degraded nutrition. We find generally, as is also the case in starvation (Chossat), that the nervous centres do not partake of the general emaciation: and this assists in accounting for the ascendancy of nervous function, which is so often remarked. Death may be produced suddenly, by syncope; or more gradually, by asthenia, or the development of cachectic diseases; or by the peculiar affection of the head, above referred to; or by slower changes in the nervous centres, leading to paralysis, etc.

In the *treatment* of anæmia, "a nourishing diet, with as much animal food as the digestive powers of the patient can master—tonics that best restore the appetite, the powers of digestion, and sanguification—the use of means, if necessary, to promote the natural excretions—and an exposure of the patient to the pure air and light of heaven, as free and as long as the strength and sensibility will bear—form the chief items of the treatment." (p. 169.) Dr. Williams has a high opinion of the utility of iron, especially the syrup of the iodide, preceded, if necessary, by some mild vegetable tonic. Besides tonics, special symptoms require appropriate treatment. Diffusible stimulants are often required to obviate temporary weakness; sedatives and narcotics, to allay nervous excitement: external stimulants, rest in the horizontal posture, and warmth in the extremities, to counteract the unequal distribution of blood. Depletion is of questionable utility; and more good may be done by mild stimulants and tonics, with derivants. If bleeding be at all employed, it should be local, and moderate. The nervous symptoms do not always cease with the removal of the anæmia; in such cases nervous excitement should be avoided; and the most serviceable medicinal means are the metallic tonics; especially valerianate and sulphate of zinc, nitrate and oxide of silver, and sulphate of copper.

Partial anæmia varies in its results, from numbness, weakness, and reduction of temperature, to the death and decomposition of the part, constituting gangrene. It may also produce softening and wasting of textures; and defective supply of blood to the secreting organs impairs the quantity and quality of the secretions.

Hyperæmia or Polyæmia is most ably treated of by Dr. Williams under the following heads:

Hyperæmia:
Excess of blood
- General = Plethora
  - with motion increased = Sthenic
  - — — diminished = Asthenic
- Local
  - with motion diminished = Congestion
  - — — increased = Determination of blood
  - — — partly increased, partly diminished = Inflammation.

Results.
Hæmorrhage.
Flux.
Dropsy, etc.

The remarks on sthenic and asthenic plethora are highly instructive; but we find that we must pass over this subject, and proceed with our analysis of the remarks made by Dr. Williams on the remaining forms of Hyperæmia.

Congestion is defined by Dr. Williams to be Local Hyperæmia with retarded motion. Its chief Causes may be classed under two heads: 1. *Those of venous obstruction;* and, 2. *Those of atony of the vessels* (capillaries and veins). Among the first kind of causes, are mechanical pressure, cold, efforts of straining, valvular disease of the heart, tubercles in the lungs, etc. A numerous class of causes is comprehended under the head of atony of the vessels. In some causes the atony is general, as in extreme debility and adynamic fevers: and the distinctive character of the congestion is to be hypostatic. It may be local; arising from over-distension from long continuance in one position, or even from congestion itself produced by some

mechanical cause; from the *intropulsive* effect of cold, or malarious and epidemic influences; or from over-excitement of the vessels, short of that degree which is necessary to produce inflammation; from sudden arrest or diminution of the proper secretion of any organ; though it is not here always easy to say whether the congestion be the cause or effect, and either is removed by the remedies employed for the other. The production of congestion by over-excitement is exemplified in several familiar instances, and may be traced under the microscope.

"When a slight irritant, as a weak infusion of capsicum, is applied to the web of a frog, it first causes contraction of the vessels, especially the arteries, then quickly follows enlargement of the arteries and other vessels with very rapid motion: after a while, the vessels gradually contract, and return to their natural size. But if the stimulant application be repeated several times, so as to prolong the determination of blood into the part, the vessels do not then uniformly contract. The arteries indeed shrink, but the capillaries and veins remain congested, and thus present completely the condition given in our definition, excess of blood with diminished motion. This dilated state of the capillaries and veins must be chiefly ascribed to their losing tone after excitement, more than the arteries; but the process which I have been describing is accompanied by changes also within the vessels; numerous pale corpuscles adhere to the sides of the small vessels, and contribute to impede the current, and cause congestion by obstruction. Whenever the stimulus applied has been strong, this obstruction amounts to entire stagnation, and many vessels appear much enlarged, and filled with stagnant blood, or rather with an accumulation of red particles entangled in the coherent pale globules. For this reason, the vessels in which the blood is stagnant, are of a deeper red than others, the red particles being arrested whilst the liquor sanguinis passes on." (p. 183.)

Asphyxia causes accumulation of blood in the right side of the heart; and also, according to Dr. John Reid, there is obstruction to its passage through the systemic capillaries. The researches of Mr. Erichsen[1] have satisfactorily proved, in Dr. Williams' opinion, that the obstruction in the systemic capillaries is produced by the smaller arteries being excited to contraction by the venous blood, the veins at the same time becoming congested; and the obstruction in the pulmonary circulation is considered by the author to be susceptible of the same explanation. There is no evidence of spontaneous movements in the capillaries, nor of the vital attractions and repulsions described by Dr. Allen Thomson. Atony of the small vessels is a cause of congestion: and the manner in which this cause operates, has been ably demonstrated by the following experiment of Dr. Williams:

"To one of Read's enema syringes, was adapted a tube with two arms: to one arm was fitted a brass tube two feet long, having several right angles in its course; to the other arm was tied a portion of rabbit's intestine, four feet long, and of calibre, (when distended with water,) double that of the brass tube. The intestine was placed in curves and coils, avoiding angles and crossings, which might obliterate the canal. The discharging end of both tubes was raised to the same height, that of the intestine being kept open by a short tube of metal. The tubes were then both filled by successive strokes of the piston; and when they both began to discharge, the quantity received from each, in a given number of strokes, was ascertained. Without giving the details, it may be stated that the small metal tube discharged from two to five times the quantity discharged by the larger but membranous tube; the difference being greatest when the strokes of the piston were most forcible and sudden, by which the intestine, although much swelled at its syringe end at each stroke, conveyed comparatively little water. The difference was further increased by raising the discharging ends higher; and when

[1] Edinburgh Medical and Surgical Journal, No. 163.

both ends were raised to the height of eight or ten inches, the gut ceased to discharge, each stroke only moving the column of water in it, but this subsiding again without rising high enough to overflow. On increasing the force of the stroke, the part of the intestine nearest to the syringe burst. . . . These experiments shew that flaccidity and increased length and size of the tube, afford impediments to the passage of liquid through it; and although the experiments exaggerate the difference between healthy and relaxed or congested vessels, yet they really prove that the increased tortuosity and number of vessels in a congested part, the greater mass of their contents, and the atonic flaccidity of their coats, do truly form additional obstacles to the passage of the blood through them, although the amount of these obstacles will vary according to the state of the connected circulation.

"These experiments illustrate a principle that is too little considered in animal and general physics: the *loss* or *neutralization* of *force, by misdirection*. The bloodvessels, in their healthy condition, are so constituted as to make the most of the heart's propulsive power, and transfer it throughout their whole length; but when dilated, tortuous, flaccid, and otherwise altered, they misdirect and exhaust it (as in the experiment with the intestine): it is partly expended in distending and dilating the nearer portion, whilst a sufficiency does not remain for the onward propulsion of the blood, which therefore stagnates and accumulates in the congested vessels." (pp. 188-9.)

The Symptoms and Effects of Congestion may be either *in the congested part, or on the system*. The local effects consist in an impairment of the vital properties—contractility and sensibility; while pain, spasm, and morbid sympathies are often produced, but in a manner much less distinct and constant than in inflammation or determination of blood. In congestion of internal organs, pain is often absent: impaired nervous and muscular function is a more constant concomitant of congestion. The natural secretions are sometimes at first augmented: but very commonly congestion leads to an increased transudation from the distended capillaries, of the watery and saline part of the blood, with albumen, and sometimes with fibrin. The following explanation is given by Dr. Williams of the manner in which secretion is impaired by congestion:

"The portions of the vascular apparatus most concerned in supplying the secreting structure, seem to be the middle parts of the capillaries, which are often so turned or convoluted; as to receive the most direct force of the current from the arteries. But when congested, the vessels leading to the middle capillaries become yielding, loose, and tortuous, and the force is much expended in dilating these before it can reach the portions which supply the secreting surfaces or cells; these portions are in the condition of the distant end of the intestine in the experiment above related, not duly receiving the force of the current. Thus the more essential effect of congestion is to impair the natural secretion. But the distension of the congested capillaries sometimes leads to a general exhalation of their more watery contents, which mingling with the natural secretion, render it watery and sometimes albuminous." (p. 191.)

Extreme distension of the vessels is the principal element concerned in effusions: they occur often in hypostatic congestion, but chiefly in congestion from venous obstruction. The result of the congestion, however, as well as the nature of the effusion, is much determined by the condition of the blood; a watery state promoting transudation of fluid with but little albumen; while, if the blood be highly albuminous and fibrinous, inflammation may result, or hæmorrhage, or, under high pressure, fluid may be effused containing not only albumen, but self-coagulating fibrin also. This seems to Dr. Williams to be the true pathology of the "fibrinous dropsies" of Vogel and other German writers.

Fluxes, also, from congestion of high tension, exhibit a large amount of albuminous matter, as in bronchorrhœa, mucous diarrhœa, and leucorrhœa.

Albuminous urine is referred to congestion of the kidney, for the following reasons, which we think conclusive: "1. The urine often becomes albuminous, during great embarrassment of the circulation, in cases of organic disease of the heart or lungs, when the kidneys are otherwise healthy. 2. I have, in many instances, observed albuminuria during the cold stage of ague, and the congestive stage of eruptive fevers. 3. In granular degeneration of the kidney, the amount of albumen in the urine is augmented by circumstances causing congestion of the kidney, and is reduced by remedies suited to remove this. 4. The most common form of Bright's disease of the kidney, in its earliest stage, presents the appearance of a highly congested structure, and is excited by causes calculated to produce congestion; such as frequent irritation of the kidney by stimulating liquors—congestion from exhausted tone; continued exposure to cold, especially after the kidneys have been thus excited—congestion from intropulsion: scarlatina probably operates as the two last combined. 5. The albumen in the urine abounds most in the congestive (first) stage of Bright's disease; the vessels becoming more or less obstructed, in the progress of the disease, by a deposit of fibrin with granular cells in the tubules, and in some instances around them; which deposit, at the same time, perpetuates some degree of congestion, whilst it supersedes the proper secreting structure." (p. 193.)

Long continued congestion is liable to produce *hypertrophy*. This is not, however, of an uniform kind, comprising equal growth of all the textures; but an intervascular deposit from effusion of lymph, at first giving a mottled appearance, as in cirrhosis of the liver, then contracting and compressing the natural structure, and causing its condensation and atrophy. The plastic products of congestion seem to be further modified by determination of blood or inflammation, and by the state of the blood itself. Sometimes they are of a fibrous or closely compacted granular structure; sometimes loosely granular, or in irregular cells, with a predominance of fat globules, indicative of a degenerated condition of the plasma.

The Constitutional Effects of an extensive Congestion, are diminution of the quantity of blood in other parts of the body. Reaction, causing febrile phenomena, may occur; when vigorous, removing the congestion; but when weak, failing in this, but constituting a low feverish excitement. If reaction do not occur, the retention of the blood in the congested part injures it in its composition, and renders it a source of contamination to the rest of the blood.

In the *treatment* of Congestion, it is important to remove the causes. Removal of pressure from the vessels, in cases arising from venous obstruction; change of posture, in congestion from gravitation; pressure to support the weak vessels; and friction and exercise to aid the defective motion, as well as to give support—are indicated according to the circumstances of the case. Astringents promote the contraction of the dilated vessels, by augmenting their contractility or tone. Their utility, however, is limited by the fact, that they may be seen under the microscope to contract the arteries more than the capillaries and veins, and hence may increase the congestion; sometimes, however, reaction occurs, and converts the action of the astringent into that of a stimulant. Stimulants are often remarkably useful in removing congestion; in some cases when locally applied, as capsicum gargle to a congested throat, in others by exciting the general circulation. Some remedies act on particular organs, and remove congestion; thus mercury sometimes is a remedy for congested liver, some diuretics for congested kidney. Dr. Williams gives the following explanation of the influence of stimulants on congestion:—"A solution of capsicum applied to a frog's web, congested after previous irritation, causes an enlargement of the arteries, and an increased flow of blood to and through the congested vessels. This flow restores motion where it was deficient, sweeps away the accumulated blood, and, in some instances, causes the vessels to contract afterwards to their natural size; so that the

congestion is completely removed ; in that case the cure is complete. In other instances, however, the stimulants fail to clear the congested vessels ; the enlarged arteries pour in more blood ; but this not overcoming the obstruction, increases the hyperæmia, and may convert it into inflammation. Thus it appears that stimulants, as well as astringents, although occasionally proving remedies for congestion, sometimes tend to increase it ; and this they are most likely to do when the congestion is extensive, or of long continuance, or when its causes are still in operation." (p. 198.) In such circumstances, depletion and evacuants are the remedies indicated. Blood-letting, by puncture or incision, in the congested parts ; cupping, or leeches, in their vicinity; derivants to cause determination of blood to other parts, among which may be mentioned the removal of atmospheric pressure from a limb, as proposed by Dr. Arnott ; or, the *hæmostatic* plan of Dr. Buckler, of Baltimore, which produces temporary congestion in distant parts, by the application of ligatures to the limbs—are all more or less useful. The necessity of employing depletory or derivative means before, or in combination with, stimulants, should be present to the mind of every one who has to treat cases of congestion of the liver, or kidneys, with interruption of their functions. Mischief is often done by an indiscriminate and exclusive use of mercury, or diuretics, in the attempt to restore the secretion of these organs. The remarks on the treatment of congestion are concluded with a few observations on those means, which, locally or generally, augment the tone of the vessels ; *i. e.* cold, astringents or stimulants, and general tonic measures.

Determination of blood is defined to be Local Hyperæmia, with motion increased. After mentioning some examples of its occurrence, in health and in disease, Dr. Williams proceeds to enquire into its *physical* Cause ; and states, that it cannot be an increased action of the heart, though this is sometimes present, especially when there is little blood in the system, or reaction is commencing after internal congestions ; nor can it be increased action of the arteries—for the only active property which we know these vessels to possess, is that of slow or tonic *contraction*. The physical cause of determination of blood, is *enlargement of the arteries ;* and this "is the effect of the pressure of the arterial distension from behind, acting on a tube which has lost some of its contractile power. The tonicity of the arteries makes them naturally resist the distending influence of the mass of blood pumped into them by the heart; but if the tonicity be impaired in any artery, that of other arteries forces into it the blood in augmented quantity, by which it is dilated, and becomes an enlarged channel for the transmission of more blood and more force. If the artery be thus enlarged, the capillaries and veins leading from it will be also enlarged, and will share the increase of blood and motion thus supplied to them. We find the proof of the enlargement and distension of arteries, leading to an inflamed or irritated part in their increased and hardened pulse ; the coats of the vessel being stretched to tightness, the pulse is no longer softened by the usual elastic spring. So, too, in the frog's web, gently irritated by an aromatic water, we see the arteries become enlarged, supplying a larger and more impulsive flow of blood to the capillaries and veins, which all become enlarged also ; and the whole vascular plexus, including vessels which before scarcely admitted red particles, then become the channels of a much increased current. This is determination of blood." (p. 203.) On irritating the frog's web, under the microscope, with a weak solution of capsicum, Dr. Williams observed, at first, a shrinking of the arteries ; this is followed by their distension, and an increased flow of blood through them. When they begin to return to their natural dimensions, the arteries sometimes assume a more tortuous shape than before, as if they contracted in diameter before their length is proportionally reduced. An objection has been made, that Dr. Williams assumes enlargement of vessels to be the cause, both of increased motion (in determination), and of diminished motion (in congestion). This he answers by shewing that,

in the former case, the enlargement is in the arteries, which are exposed directly to the propulsive power of the heart; while in the latter, the veins and capillaries are enlarged, while the arteries are not so, or are even contracted, and thus more or less inadequate to transmit the force of the heart.

As to the *physiological* cause of determination, it is true that in some cases there is previous contraction of the arteries; but this will not always hold good. The effects of the nerves, on the contractility of the vessels, requires further investigation. Dr. Williams admits that they may be concerned in causing determination of blood, probably by reducing the contractility of particular arteries; but dissents from the opinion, supported by Dr. Billing, that contractility is derived from nervous influence. The *final* cause of determination of blood is to support the well-being and function of a part. If it be moderate, it increases the redness, warmth, sensibility, and other functions; if in excess, it disorders and alters them.

Some causes of local determination of blood, act in distant parts of the vascular system. Cold is an example of this, chiefly in persons endowed with much irritability of heart, and with but little blood. Determination is often accompanied by symptoms indicating deficiency of blood in other parts of the body; and this furnishes an important therapeutic indication.

The General Symptoms of Determination of Blood, are described by Dr. Williams, as consisting in exaltation of the nervous properties and natural secretions of the part. The nutritive process is only affected when the determination is constant or often repeated; and then the hypertrophy, which results, is of a more simple and uniform kind than that arising from congestion. The process of absorption, though favoured when the current is accelerated without distension, is often unequal to the effusion. The parts most subject to determination of blood are those nearest to the heart, and those most freely supplied with blood-vessels. In determination of blood to the *head*, two series of symptoms occur in different cases, in addition to the increased beating of the carotid and temporal arteries, flushing, and increase of the symptoms on stooping,—the one series of symptoms being those of simple excitement of the nervous centres, the other indicating a temporary oppression of nervous function, occasionally with various convulsive affections. The explanation of this is to be found, according to Dr. Williams, in the fact that moderate excitement will produce an increased, but equal flow of blood through the head; but if the excitement be in excess, blood is forcibly conveyed to the brain, without an equal increase in the passage of the blood through it; and this for two reasons:—"1. We have already found that a certain proportion in the size and elasticity of the vessels best qualifies them to transmit blood freely; and that where this is wanting, increased force does not compensate for it, but often causes new disorder. Thus, in violent palpitation of the heart, the aorta, carotid, and subclavian arteries, are often dilated, and throb strongly; but the weak pulse at the wrist shews that much force is expended on the larger trunks, without reaching their distant branches. This, too, is one reason why, in determination of blood to the head, the force is sometimes more expended on the larger vessels at the base of the brain, than transmitted throughout its substance. 2. Another reason for unequal or defective excitement from determination of blood to the head, is the unyielding nature of the skull, which permits no considerable enlargement of any of the vessels within it, without a corresponding diminution of other vessels, and a general compression of the cerebral substance. Hence distension of the arteries, beyond a certain degree, will compress and obstruct the small veins, and thus prevent that freedom of circulation on which functional activity depends. On these principles may be explained the production of symptoms of depressed, as well as of excited energy of the nervous centres, and often a mixture of both, from the same cause—determination of blood." (p. 209.) The causes and symptoms of determination of blood to the *kidneys*, *mucous membranes*, and *skin*, are next briefly

noticed. Determination of blood is commonly transient; but when permanent, commonly leads to increased secretion in the immediate neighbourhood, or hæmorrhage, or inflammation. Distant parts are at first cold, but afterwards subject to febrile reaction. If long continued, it may produce hypertrophy—either natural, as in muscles; or degenerated, as in the kidneys and liver. In these cases, the effect is commonly modified, by the presence of congestion and inflammation, and the plastic condition of the bloodi tself.

In the *treatment* of determination of blood, an obvious indication is, when possible, to remove the exciting causes. The proper remedies are considered by Dr. Williams, under the heads of cold and astringents, to promote the contraction of the distended vessels: derivants, to draw away the blood by relaxing other parts of the vascular system, as purgatives, and especially bleeding, where determination to an important organ is combined with some plethora or local congestion; antimony and similar remedies to produce a general relaxation of the tonic fibres of the vascular system, and an equalization of the force and blood conveyed by it; sedatives to reduce the heart's action; and tonics, where determination obviously results from weakness of the circulation, to give tone to the contractile fibre, and improve the quantity and quality of the blood. These remedies require judicious combination according to the circumstances of the case: and the secretions are to be kept free and equally balanced. In all cases, country air and exercise, suited to the strength, is beneficial; and habits of posture opposed to the peculiar determination should be enjoined.

The results of Hyperæmia are next treated of, under the heads of Hæmorrhage, Flux, and Dropsy. These are conditions to which plethora, congestion, and determination of blood tend, when yet short of the conditions necessary to produce inflammation.

After noticing the production of hæmorrhage from general plethora, congestion from venous obstruction, weakness of the vessels, or from the intropulsive operation of cold, and from determination of blood, Dr. Williams observes, that "all cases of general or local hyperæmia, now noticed, do not result in hæmorrhage: some additional element is wanting; and this additional element may be either in the *blood-vessels* or in the *blood*." The blood-vessels may be inelastic or fragile from osseous or atheromatous deposits, or aneurismal dilatation; or softened and lacerable from inflammation or malnutrition; or they may be opened by actual ulceration or suppuration. Mechanical injury may also cause rupture of blood-vessels. Sometimes the blood is defective in fibrin, but abounding in red particles, as in petechial fevers, congestive apoplexy, hæmorrhagic small pox, and other exanthemata. But in other cases, the *quality* of the red particles and fibrin appears altered; this is probably the case in scurvy and purpura. There seems to be evidence of a diseased state of the red particles, in the readiness with which the textures become stained, and of want of contractility and plasticity in the fibrin, in the failure of the healing process. In those cases in which blood is poured out in considerable quantities, without rupture of large vessels, it is not probable that the blood particles can escape through the walls of the capillary vessels, but that many minute vessels become ruptured at once. In connexion with this, there is probably an altered state of the blood; and Dr. Williams observes, that "all cases of this description, which have lately come under my notice, have included an altered state of the blood, generally of the nature of uræmia or cholæmia." (p. 217.)

Besides differences in seat, hæmorrhages are distinguished into *active* or *sthenic*, arising from sthenic plethora, or from determination of blood; and *passive* or *asthenic*, occurring in connexion with asthenic plethora, or with congestion. In active or sthenic hæmorrhage, the full hard pulse of plethora is modified by a remarkable jerk or thrill, which is important when hæmorrhage is only suspected. This is ascribed by Dr. Williams to "an unusual abruptness of the heart's contraction, combined with irregularities in

the tonicity of arteries in different parts, which cause these to react in successive jerks at each pulse, instead of simultaneously." (p. 218.)

The effects of considerable hæmorrhage, especially if rapid, are cerebral or cardiac syncope, according to the posture of the patient, and a state of anæmia. In the reaction which succeeds, the pulse exhibits, most strongly, the jarring or vibratory character; and sometimes various symptoms of partial nervous excitement occur, as in anæmia. During reaction, the hæmorrhage may be renewed. If the hæmorrhage be inconsiderable, or be suddenly checked by styptics before the vascular fulness or determination have been reduced, inflammation may ensue; but if considerable, it may remove the hyperæmia, and the various local affections which it had produced. The effused blood may produce various disturbances in the parts into which it is effused; as is exemplified in the brain, lungs, glands, and other complex textures. Passive or asthenic hæmorrhage may produce relief if moderate, or exhaustion and anæmia if profuse; or reaction, sthenic hæmorrhage, or inflammation, may occur if it be too suddenly checked. The hæmorrhage connected with an altered state of the blood is generally asthenic, though excitement or determination of blood may come on here also.

In the *treatment* of hæmorrhage, it is to be borne in mind that it is often a salutary process, as in moderate epistaxis or hæmorrhoidal flux. But if it be profuse, it is to be restrained; the sthenic form by artificial bleeding and derivants, and the asthenic by styptics. In some cases, it requires immediate interference; as when it occurs in the lungs or brain; or is excessive in any form, or even moderate in very weak subjects. In *active* hæmorrhage, bloodletting is generally available, with evacuants, and remedies to reduce the power of the heart and the tonicity of the arteries. Cold is also an important remedy, when it is connected with determination of blood; but Dr. Williams does not approve of the practice recommended by some, of applying ice to the chest for hæmoptysis; he has seen pneumonia thus induced.

In *passive* or *asthenic* hæmorrhage, besides styptics, general or local depletion, with derivants, accompanied or followed by tonics, may be useful in relieving plethora or local congestion.

In all kinds of hæmorrhage, if the blood-vessels be diseased, the quantity of blood sent to them is to be diminished by bloodletting, pressure, posture, cold and astringent applications, and means calculated to tranquillize the whole circulation. Perfect rest, and a cool regimen, should be observed in all cases. The altered state of the blood is perhaps more influenced by styptics; some of which are astringents, causing contraction of the tonic fibres of the vessels and other parts, while others also coagulate the blood. These remedies may be applied either directly to the part, or may be administered internally when the bleeding part is beyond reach. Hæmorrhages from the intestinal canal, as well as in some other situations, are often relieved by increasing the proper secretion of the intestinal mucous membrane, and of the allied glands, by mercurial and saline purgatives, in combination with sulphuric or nitric acid, alum, and sulphate of zinc. These probably act also on the condition of the blood.

Effusion of the watery part of the blood, constituting, when in secreting organs or on open surfaces, FLUX, and when in closed sacs or cellular textures, DROPSY, is the next subject treated of. These may each be produced by general plethora, but commonly when the blood-vessels contain an inordinate quantity of watery constituents. Excessive drinking, or external cold, especially when the kidneys fail in performing their functions, may induce dropsy or flux; also the sudden suppression of a cutaneous eruption, or of the discharge from an old ulcer. Instances of the production of flux or dropsy, especially the latter, from venous obstruction, are numerous. Aneurism, tumours, pregnancy, and ovarian dropsy, may all cause ascites or anasarca by pressure on the large veins. The ascending cava has been found, by Dr. Williams and Dr. Watson, obliterated in cases of anasarca and ascites; and

M. Tonnele's observations favour the opinion that chronic hydrocephalus is produced by a partial obliteration of the venous sinuses of the head. But the most common causes of venous obstruction, and hence of dropsy, or flux, are certain visceral diseases, as contractile disease of the liver, structural disease of the heart, and pulmonary congestion from causes impeding the respiration. Fluxes and dropsies may also arise from weakness of the circulation and atony of the vessels, or after previous excitement of the vessels of the part; fluxes may also be produced by the intropulsive operation of cold.

The production of fluxes, by determination of blood, is familiarly exemplified in the results of the application of local stimulants; but sometimes the flux may be referred to determination of blood without special irritation. Dropsy less frequently results from determination of blood, which seldom occurs in closed sacs, independently of inflammation. Tubercles may, however, produce dropsy in serous cavities, by inducing determination of blood. Fluxes and dropsies, as they both commonly arise from similar conditions of the vascular system, are often found to succeed to, and relieve, one another.

But, besides hyperæmia, certain conditions of the vessels, and of the blood, are required to determine the occurrence of flux or dropsy, as of hæmorrhage. Extreme or long-continued vascular distension may produce them; but sometimes they are out of proportion to the hyperæmia, and are then to be traced to a lax state of the vessels, or to a poor watery state of the blood, or to both these conditions together, as after long fevers, defective nourishment, or confinement in impure air. A watery state of the blood obviously tends to promote dropsy and flux, not merely by its greater proneness to exude through the walls of the vessels, but by the failure and irregular distribution of the force of the circulation, in consequence of the watery and squashy nature of the blood.

In connexion with the subject of impoverished blood, in its relation to dropsy, Dr. Williams makes some valuable remarks on imperfect excretion, as a cause of this condition. Failure in the function of the kidneys appears to be essential to the production of dropsy from cold; mere checked perspiration may cause congestions, hæmorrhages, and even fluxes; but if the kidneys be healthy, dropsy will not ensue. Dr. Williams thus explains the occurrence of dropsy and albuminuria from exposure to cold after intoxication: "The vital properties of the kidneys had been exhausted by the excitement of the stimulant beverage, so that when cold checks the perspiration and throws the blood on internal organs, the kidneys cannot perform their vicarious action; their vessels become distended with blood, and mechanically exude serum instead of separating the proper constituents of urine: these and the superfluous water accumulate in the blood, and, by their quantity and irritating quality, cause effusions of serum containing urea in different parts of the body, as well as various other functional disorders." (p. 229.) The occurrence of dropsy after scarlatina he considers to depend on a diseased action of the kidney. He remarks, in common with many other observers, that the anasarca is not always in proportion to the amount of eruption; and supposes that scarlatina causes in the kidneys a highly congested state, which injures their secreting power.

The dropsy which arises suddenly after exposure to cold, or scarlatina, has received the name of inflammatory, febrile, acute, or active dropsy. So far as these terms imply an excited state of the vascular system, they cannot be objected to; and that such a state exists, is proved by the buffy coat of the blood drawn, and by the effusions being often accompanied by symptoms of inflammation. This character appears to depend on the irritating quality of the excrementitious matter left in the blood; and Dr. Williams traces analogies between the effects of retention of urea, and of lithic and lactic acid (gout and rheumatism). Besides the retention of urea, there is a loss of albumen from the blood, especially in the more chronic cases and in anæmic subjects, in whom almost every congestion or determination of blood ends in

watery effusion. The effusion in these cases is, as the powers of circulation fail, connected chiefly with gravitative congestion; and affords a contrast to that which accompanies acute albuminuria, which affects the face, trunk, and upper extremities. From his observations, Dr. Williams infers that dropsy may be described as acute, active, or sthenic, arising chiefly from the retention in the blood of excrementitious matter and water, which the kidneys fail to eliminate; and passive or asthenic, often originating in the same way, but rather dependent on a poor and watery state of the blood, especially deficient in albumen. He shows, also, that dropsy may arise from an impoverished state of the blood, independent of renal disease. Having so far traced flux and dropsy in common, Dr. Williams states the chief pathological cause of general dropsy to be a diseased condition of the blood, dependent on defective excretion, or on defective nutrition or assimilation. Flux is more commonly associated with a lax state of the solids. Hence flux is generally a more partial disease than dropsy. The matter effused is not so much an excess of the natural secretion, as an addition of a thin, watery, and sometimes albuminous fluid from the blood.

In the general *treatment* of flux and dropsy, we have to apply the remedies for the several varieties of hyperæmia which may be present, and to vary our treatment according to the sthenic or asthenic character of the affection. The success will depend much on the power we possess of correcting the morbid condition which has caused the flux or dropsy. In causes resulting from vascular congestion or fulness, depletion, followed by remedies to increase the secretions, are most efficacious; but where there is a relaxed state of the solids, and a watery condition of the blood, a tonic plan of treatment is indicated, at the same time that we endeavour to derive from the affected parts, and to restore defective excretions.

In all cases of flux, it is proper to derive from the affected part; to avoid circumstances which promote congestion in it; and sometimes to counteract or remove the irritations or obstructions which the flux causes in the parts which it affects. The distinction in the treatment of sthenic and asthenic flux is clearly pointed out. In the former case, where the disease borders on inflammation, it is improper to attempt to check the disease by astringent remedies; but evacuants, antimonials, sedatives, and even blood-letting, are indicated. In asthenic fluxes, which form the majority of cases, astringents, stimulants, opium, and general tonics—medicinal and hygienic—are indicated: and Dr. Williams points out the propriety of avoiding excess in liquid food, especially tea and warm slops. These fluids cause a temporary plethora, which finds vent through the lax vessels of the weak part.

In acute or inflammatory dropsy, which is associated with renal congestion, the remedies are at first, blood-letting, especially by cupping to the loins, hydragogue purgatives, and diaphoretics; then some kinds of diuretic medicines. Of the hydragogues, cream of tartar in doses of ʒiv to ʒx, every morning, or alternate morning, and elaterium in doses of gr. $\frac{1}{4}$, are the most effectual. Blisters may be used after cupping to the loins, or even at once, in asthenic cases, which do not bear much loss of blood. After the use of depletion, cathartics, and diaphoretics, diuretics become useful; and Dr. Williams thinks the tincture of cantharides, in doses of m x to m xx, or ʒss, thrice a day, the most powerful. But if it irritates the kidneys, without increasing the circulation, it is sure to do harm. Mercury is of doubtful utility in removing congestion of the kidney, as it so speedily and severely salivates in such cases. But in combination with squill, digitalis, and henbane, or conium, it is most useful in all other recent cases of dropsy. Together with these remedies, tonic and supporting treatment is indicated in the asthenic and chronic forms of dropsy; and in those cases arising from permanently diseased heart, liver, or kidneys, which have a tendency to recur again and again, it is needful to vary the remedies, as well as to support the strength. "It is an important point, in the treatment of such cases, not to exhaust the

powers of any secreting organ by too long acting on it, and not to expend the efficacy of any one remedy by too long continuing its use. By employing sometimes diuretics, sometimes purgatives, sometimes diaphoretics, and by aiding each of these, by local depletion or derivants, or by stimulants and tonics, according to the temporary prevalence of vascular fulness and excitement, or the converse, much may often be effected to prolong life. It is in the application of these rules to the treatment of prolonged cases, that the skill and resources of the rational practitioner are most tried, and his superiority over the routinest is best proved. It is under these circumstances, too, advantageous to have at command a great variety of medicines, particularly diuretics, and to alternate them or vary them in order to increase or maintain their effect. Those that I have found most effectual are—combinations of mercury, squill, digitalis, and conium (not in acute albuminuria); combinations of decoction of broom, or pyrola umbellata, with nitrate and acetate of potass; the juice or extract of taraxacum, with the same salts or bitartrate of potass, or with nitric acid (particularly in hepatic disease); infusion or tincture of digitalis, with iodide of potassium, and bitartrate of potass (in dropsy after scarlatina); the same, together with increasing doses of tincture of cantharides (in asthenic cases of albuminuria, after cupping to the loins and hydragogue purgatives); ammonio-tartrate and ammonio-citrate of iron in Seltzer water (in asthenic dropsy); gin in cream of tartar beverage (imperial); compound spirit of juniper, spirit of nitric æther, with various others (in cases of debility). The latter stimulant diuretics have disappointed me more than any of the rest." (pp. 241-42.) When diuretics and other remedies fail, relief must be afforded by giving exit to a portion of the fluid; and in performing acupuncturation, the tendency to low inflammation and gangrene should be remembered.

The subject of Local Hyperæmia, with motion partly increased, partly diminished, constituting inflammation, is next fully and most ably treated of by the author. After some remarks on the definition of the term Inflammation, he proceeds to consider the Predisposing and Exciting Causes. The latter are either *local* irritants, mechanical, chemical, and vital, acting chiefly where there is a previous excited state of the vascular system—causing determination of blood; or *general*, acting indirectly on a depressed state of the whole vascular system—producing congestion. The various local and general causes are enumerated; and their mode of operation examined. Some causes (irritants) probably operate first on the nerves, for the following reasons:—1. Their action on the sensitive nerves is felt long before inflammation begins. 2. The irritation is sometimes transferred to other parts by sympathy. 3. An injury to a nerve is sometimes followed by inflammation in parts connected with this nerve; thus paralysed limbs are apt to become inflamed. But, on the other hand, Dr. Williams observes that—"1. Some of the causes of inflammation (the majority of those inducing internal inflammation) produce, on the nerves and nervous system, no known primary effect, which resembles that of other causes of inflammation (irritants): thus inflammations excited by cold, are often preceded by no marked constitutional disturbance; whereas the strongest impressions of cold on the system are frequently not followed by inflammation. 2. Inflammations often originate in congestions, and in the sudden suppression of hæmorrhages, and other discharges, without the occurrence of any symptom referable to the nerves; hence inflammations thus arising may escape detection, and are called *latent*. 3. Persons in whom nervous properties are most developed, are not those most susceptible of inflammation, and all varieties of nervous excitement are sometimes manifested in the highest degree without any inflammation ensuing. . . . 4. Inflammation readily occurs in parts, the nerves of which are paralysed, or have been divided." (pp. 249-50.) It is here to be concluded, that an impression on the nerves, is not an essential part of the first process of inflammation. Having noticed the causes, Dr. Williams proceeds to explain

the Nature and Phenomena of Inflammation. There is evident proof of enlargement of the blood-vessels in an inflamed part, of determination of blood to it, of increased motion through it;—so far determination of blood is proved to be present. But, also, as has been shown by Thomson, Hastings, Kaltenbrunner, and Marshall Hall, there is more or less *obstruction* to the flow of blood in the inflamed vessels. "Thus in the frog's web, when a part inflames from local irritation, the blood is seen to move slowly in the part most irritated, and gradually accumulating in the vessels, renders them larger, redder, and more tortuous, until the motion ceases altogether in them, whilst neighbouring vessels are still the channel of an increased current." (p. 232.) The obstruction has been ascribed to various causes, as spasm of the extreme vessels, weakness of the capillaries, active dilatation of these vessels, or vital attractions and repulsions between the blood and the solids. These theories are discussed by Dr. Williams, and dismissed by him with the following observation:—"If we succeed in explaining the nature and effects of inflammation, by a reference to ascertained properties, it will be needless and unphilosophical to assume the existence of others, which are mysterious and unknown. We do not pretend to propose these explanations as complete or certain, but as the best that we can devise in the present state of science, and the most consistent with well established facts; and it is very satisfactory to observe, that the discoveries in chemical physiology, made since the first edition of this work was written, so far from invalidating these views on the nature of inflammation and its results, go far to confirm and extend them." (p. 255.) The cause of the stagnation, must be either in the vessels, or the blood, or in both; and the latter is the true cause. With regard to the state of the vessels, atony and flaccidity impede the current, not by preventing active contraction—a property which does not exist—but by removing the tone by which the vessels maintain the calibre and tension best calculated to transmit the force of the current. "Vessels thus weak and inelastic, instead of equably conveying the current, become distended, lengthened, and tortuous, in receiving it; and by their very mass, as well as their inelasticity, they partly break the force of the current, and partly turn it into other channels. . . . In determination of blood, the arteries are enlarged, and so are the capillaries in due proportion; the circulation is therefore equally increased. In congestion, the capillaries are enlarged, without any increase of the arteries; the motion is therefore impaired; but still, being gentle, it may diffuse itself through the mass, which moves slowly. But if to congested capillaries, there be added the increased and abrupt force of the current from enlarged arteries, or if to determination of blood (enlarged arteries), an atonic congestion of the capillaries be joined, the propulsive power of the current will be impaired. As in the experiment with intestine, the blood will pulsate, or oscillate, in the distended vessels, rather than pass through them; and the main current will pass through collateral anastomosing channels, which become the seat of simple determination or increased flow. This is just the state of things in the incipient stage of inflammation; and if either the capillaries do not speedily recover their tone, or the arteries do not contract, the blood in parts becomes stagnant, its particles adhere to each other, and to the walls of the vessels, and the obstruction is confirmed. The arterial portions of some of the obstructed capillaries are still open, and exposed to pulsative force from the supplying arteries, which continues to strain their coats, and cause an oscillatory motion of their blood particles, but no passage through them. Such are the phenomena which we see under the microscope." (pp. 256-57.) One cause, then, of the stagnation of the blood in an inflamed part, is a weak inelastic state of the capillary vessels, such as exists in atonic congestion;—and many causes of inflammation, even irritants, act by first producing congestion. But there are also changes in the condition of the blood within the vessels. Dr. Williams and Dr. W. Addison, in their microscopic researches on inflammation, have noticed an increase in the

number of white globules, under irritation ; these roll slowly along the side of the vessels, with a great tendency to adhere to them, and may become so numerous, as to prevent the red particles from passing. Hence the chief cause of obstruction, as regards the blood, seems to be comprised in the two circumstances—" the *increased production of the white globules*, and *their remarkable disposition to adhere to the walls of the vessels and to one another*." These white corpuscles are spheroidal, of a gelatinous consistence, and composed of granules, some of which have the appearance of nuclei ; and, according to Dr. Addison, they are invested by a granular membrane. They appear to consist of fibrin, or rather, deutoxide of protein ; and each granule has probably a central nucleus or molecule of fat. Their increase seems to be not merely from their being arrested in their transit through the inflamed vessels, but from their being actually formed in greater numbers ; and Dr. Williams is of opinion, that the determination of blood is sufficient to account for the oxidation of the protein in the obstructed portions, and its conversion into the deutoxide. Their tendency to adhere to the walls of the vessels he considers to be the mere result of the physical property of adhesiveness, common to soft solids of glutinous material; and those first formed in inflamed blood, do not appear to him to be provided with an envelope. The red particles, according to Dr. Williams, as long as they can pass, *shew no disposition to cohere, or form rouleaux ;* but if the white corpuscles obstruct their path, their flexible and elastic bodies become jammed by the current from behind, in the interstices of the white corpuscles, so that the whole vessel speedily presents an almost homogeneous deep red colour.

From his experiments and observations, Dr. Williams concludes that, " the most essential character of inflammation consists in an increased motion or determination of blood to the affected part, with a more or less obstructed flow through the part : the force of the increased motion being partly expended in the arterial portion of the dilated capillaries, and partly diverted into the collateral channels so abundantly supplied by the anastomosis of vessels. The obstruction in the vessels of an inflamed part we have found reason to ascribe in part to the increased mass in the smaller vessels, and to the diminished elasticity of their coats ; and in part, to the unusual formation of white corpuscles, which adhere to the walls of the tubes, and to each other. Of the exciting causes of inflammation, the direct irritants seem to produce obstruction in both these modes ; those which act indirectly, on the other hand, in the first instance produce congestion—to which determination of blood being subsequently added, the inflammatory process begins : hence the latter causes, although very common, are not so sure of exciting inflammation as direct irritants are.

" The effect of these changes, essential to inflammation, is, to expend much of the circulating force conveyed by the arteries on their capillary terminations : and the enlargement and tortuosity of these capillaries, the production of globules which adhere to their sides, and their total obstruction by the same means, seem to be so many progressive expedients used by nature to direct the force of the circulation to that part of the vessels by which the process of reparation and nutrition is chiefly carried on. We have further suggested, that an obvious effect of this local direction or determination of force, is to supply oxygen more freely to the plasma, and the resulting formation of a solid deutoxide of protein, is the obvious explanation of the formation and increase of those white corpuscles which augment and complete the obstruction." (pp. 265-66.)

In inflammation, the impairment of vital properties arising from determination and congestion will be not only combined, but exaggerated, and it is this approximation of two such opposite conditions, excitement and interruption of living actions almost at the same spot, that renders continued inflammation so seriously destructive to structure, as well as to function. Deferring, for the present, the consideration of the general symptoms pro-

duced by inflammation, Dr. Williams notices at some length the change in nutritive secretion, a most important and early part of inflammation. The effusions from inflamed vessels at an early period, resemble those from congestion, or determination of blood; but they are commonly more abundant, and contain more animal matter. Fibrin is effused; which may concrete, or remain dissolved in the effusion, forming a clot when this is removed from the body. In complex textures it produces hardening, and in mucous membranes there may be thickening of the submucous texture, and unusual viscidity of the secretion. The following is the summary given by Dr. Williams of the forms of solids in inflammatory effusions, as seen under the microscope :—"1. *Molecules*, immeasurable from minuteness, each appearing merely as a dark speck. Probably composed of a fatty matter (Davy, Gulliver.) (*Smaller primitive molecules;* Gruby.) 2. *Granules* (Gerber, Addison), measuring from 1-12000 to 1-8000 of an inch, appearing as a light spot, surrounded by a dark circle. Probably consisting of deutoxide of protein, with a central molecule of fat. (*Larger primitive molecules;* Gruby.) 3. *Fibrils*, extremely fine, interlaced and decussating, the same with those seen in the buffy coat of the blood. 4. *Lymph or exudation corpuscles, compound granules, granular cells*, measuring from 1-6000 to 1-700 of an inch (Gulliver), composed of granules and molecules, and sometimes enveloped in a cell. 5. *Pus globules* appear to be enlarged modifications of the last; but more distinctly cells, containing liquid with more or fewer granules, some of which are of larger size than the rest, and forming nuclei. Besides the solid deutoxide of protein, which constitutes these solid parts, they contain a dissolved form of protein, the tritoxide. 6. *Irregular granular and hyaline matter;* the former of albuminous composition, with more or less fat: the latter also albuminous, with more or less gelatine. These constitute the materials of tuberculous and other aplastic or cacoplastic deposits. They often exhibit traces of cells and fibres, but appear degenerated or imperfectly formed. In addition to the above, inflammatory effusions usually contain the usual solids generated by the part, such as mucous globules, epithelium scales, epidermis, and also blood corpuscles." (pp. 268-69.) There is a close resemblance between the exudation corpuscles, and the white globules, seen in the vessels; but the opinion of Dr. Addison, that the latter pass bodily through the walls of the vessels, seems scarcely tenable; and the author thinks it more likely, either that extremely minute nuclei, or molecules, do pass through the walls, and then grow and propagate compound granules; or that corpuscules are formed by coagulation in the effused liquor sanguinis. These solid products are the materials which give rise to new membranes, textures, and deposits; and possess every variety of plasticity, from perfect cicatrices and false membranes, down to yellow tuberculous matter. The results of the effusion, which always attends inflammation, may be relief of the inflammation; otherwise it may produce *softening*, *suppuration*, *sloughing*, *gangrene*, *sphacelus*, or *induration*.

The Local Symptoms of Inflammation—redness, heat, pain, swelling, and impaired function, and the General Symptoms, constituting inflammatory fever, are next noticed; but we must content ourselves with recommending our readers to peruse the observations made by Dr. Williams on these subjects, and proceed to analyse his remarks on the Nature and Symptoms of the Terminations, or Results of Inflammation. These are classed under four heads :—Resolution, Effusion (including Adhesion), Suppuration (including Ulceration), and Gangrene.

Resolution consists in the removal of the inflammation and its effects, and may occur spontaneously, or from treatment; or there may be what is called metastasis, which Dr. Williams ascribes to the mobility of the peculiar *materies morbi*. It seems uncertain whether the lateritious sediment in the urine, at the decline of inflammatory fever, is a cause or effect of the improvement. It appears, however, that though the function of the kidneys must be first

impaired, yet the matter retained in consequence, tends to keep up the disorder; and by promoting its elimination, we best succeed in reducing febrile excitement. When the function of the kidney is impaired by congestive degeneration, inflammatory and other fevers often prove fatal to the patients.

Effusion is not always a termination of inflammation, but often produces mischievous effects. In the *serous membranes*, we find, according to the degree of motion permitted, bands or threads, films, granules, or patches. The lymph thus effused is at first transparent; afterwards it becomes yellowish, and more or less opaque, but in inflammation of a healthy subject generally retains some degree of translucency. In this respect it contrasts with the opaque purulent and tuberculous lymph effused in unhealthy subjects. Its most important character is its organizability, which character Dr. Williams designates by the term *euplastic*. It consists of fibrils of fibrin crossing each other, with numerous simple and compound exudation corpuscles; and after being arranged into the basis of a texture, it is supplied with blood-vessels. How these vessels are formed, is scarcely determined. *Cacoplastic* lymph is the product of inflammation of a low character, when the blood is poor in red particles; and constitutes the formations known as cirrhosis and crude yellow tubercle, which are the lowest of the organizable products. These deposits sometimes exhibit traces of blood-vessels, but sometimes are totally destitute of vascularity. "Being, in organization and consistency, dissimilar to the membranes on which they are formed, they prove a source of irritation and constriction; and being liable to ulterior changes (shrinking and contraction in the case of cirrhosis; further degeneration and softening in the case of yellow tubercle), they may bring further mischief in contiguous parts." *Aplastic* lymph is totally incapable of organization, and is thrown off in the form of pus; or in detached opaque flakes or curds, consisting of aggregations of irregular granules, oil-globules, and molecules, held together by a few fragments of fibrils. These products obviously act prejudicially on the structures which contain them; and are little susceptible of absorption. The plasticity of lymph may be lowered by a low form of inflammation, and an unhealthy character of the blood: also by long continuance of any inflammation, or by its occurrence in subjects in whose blood fibrin abounds, while the red particles are scanty,—the effused product being either gradually removed beyond the reach of vascular communication, or being of low vitality. The admixture of the colouring matter of the blood—probably in a diseased state—tends to lower the plasticity of lymph. It sometimes, according to Mr. Dalrymple, tends to accelerate its organization.

The products of inflammation of *mucous membranes*, according to Gerber, Henle, and Gruby, "microscopically consist of pus and mucus globules, granular cells, granules, and molecules, together with more or less amorphous and glutinous mucus, and scales of epithelium." Dr. Williams states that serum is present in the early stage; and at an advanced stage there is an increase of fatty matter. There may also be effusion into the submucous tissue, giving rise, if not removed, to indurations and strictures.

The products of inflammation of the *skin*, *cellular texture*, and *parenchymatous organs*, are next briefly noticed.

The effects of effusion may be to aggravate some of the symptoms of inflammation, while others are more or less relieved; and the relief afforded to the inflammation may be counterbalanced by the exhaustion produced in the process of throwing off the effusion. The effects will be more harassing where, as in some cases, the effusion fails in relieving the inflammation.

Dr. Williams commences his remarks on Suppuration and Ulceration with a description of pus, and of its constituent corpuscles. He considers, with Mulder, that the disintegration and liquefaction which take place in the formation of pus, seems to depend on an increased oxidation of the protein, so that it passes from the state of solid deutoxide to that of soluble tritoxide. There is also a reduction of vitality, and tendency to degenerate, in the

exuded corpuscles. The circumstances which determine suppuration, as a result of inflammation, are chiefly three: 1. A certain intensity and duration of the inflammation, which, by exaggerating the salutary effects of determination of blood and obstruction—oxidation of the protein into an organizable material—gives an ascendancy to the chemical over the vital powers. 2. The access of air to a wound favours the formation of pus; chiefly, doubtless, by directly supplying oxygen, but also probably by operating as an irritant. If admitted in limited quantity to a large collection of pus, air gives rise to decomposition. 3. A peculiar condition of the blood promotes the formation of pus: this is called the *suppurative diathesis*, and is presented in cachectic or ill-conditioned subjects. Dr. Williams believes that the most common cause of this is the presence of pus in the blood itself: this product having been found in the blood, and probably existing therein in all cases of suppuration. The discovery of *purulent deposits*, especially in the lungs and liver, affords a proof that pus in some way is often conveyed in the circulation, and, being arrested in these organs, gives rise to the formation of more, and to the production of most formidable effects. In explaining the presence of pus in the blood, it is not to be supposed that it is absorbed through the walls of the blood-vessels; but it may get into the blood either by an opening in a vein, or by suppurative phlebitis, or, as shown by Mr. Gulliver, by being formed within the blood-vessels in other cases of severe inflammation. Some remarks on Hectic Fever and on Gangrene follow.

The Varieties of Inflammation are next noticed. Under this head, Dr. Williams treats of the following varieties: *sthenic* and *asthenic; acute, subacute*, and *chronic; congestive; phlegmonous; erysipelatous; pellicular* or *diphtheritic; hæmorrhagic;* and *scrofulous;* and merely alludes to the specific inflammations—*gouty* and *rheumatic, syphilitic*, and *gonorrhœal*. From the remarks here made, we can only extract, as a specimen, the following explanation of the symptoms which attend the worst forms of *erysipelatous* inflammation: "These adynamic or typhoid symptoms show the presence of something more than a form of inflammation, and that something must be considered to be a poison. It is probable that this poison sometimes originates in infection; for persons in the same room, or who have had much communication with a patient with erysipelas, have been more frequently attacked than others; but it is also pretty certain that bad ventilation, and a crowded, uncleansed state of surgical patients, are capable, at any time, of rendering common inflammation erysipelatous; and this effect is much promoted by unknown epidemic conditions of the atmosphere. The most probable hypothesis which we can form of this matter is, that, under certain circumstances, the products of inflammation become (as we know they sometimes do) poisonous, and capable of acting (as many animal poisons do) as local irritants and general sedatives or depriments; that they then modify the character of the inflammation, and depress the whole vital powers (as we have found pus and gangrenous matter do); and that their effects, and the general and local reaction against them, lead to the various degrees and forms which we find erysipelatous inflammation and its accompanying fever present. The same morbid matter, being transferred by any of the three modes of infection to other persons, may induce erysipelas in previously existing inflammation, or, if strong enough, may develope it anew in the body. The fact that patients often *sicken* with fever (rigors, vomiting, headache, quick pulse, delirium, etc.) before the erysipelatous inflammation appears, is a sufficient proof that the poison acts on the constitution as well as on a part; and the fact that weakly persons, and those with previous structural disease, (especially of the kidneys,) chiefly suffer from the worst effects of erysipelas, shows the essentially depressing operation of the poison. In several cases of the worst forms of erysipelas, I have found pus globules in considerable numbers in the blood of parts remote from the affected textures, which corresponds with the observations of Mr. Gulliver. This might suggest that pus is the poisonous mat-

ter; but although it is highly probable that these pus globules do partake of the septic tendency formerly noticed as belonging to foul kinds of matter, yet it is likely that the noxious matter occurs and spreads, in a more subtle form, in solution or even in vapour, as shown by the pernicious properties of the liquor puris, and its fœtid odour." (pp. 313-14.)

Treatment of Inflammation. A careful study of the elements of which the complicated process of Inflammation consists, will form the best guide to its rational treatment. The following table, which we copy from p. 322 of Dr. Williams' work, exhibits at one view the remedies which may be opposed to each of the elements and results:

TABULAR VIEW OF THE CHIEF ELEMENTS OF INFLAMMATORY DISEASE, AND THEIR REMEDIES.

CONSTITUENTS OF INFLAMMATION.	ANTIPHLOGISTIC REMEDIES.	
1. Congestion	Astringents; stimulants; evacuants	For incipient inflammation.
2. Irritation of nerves	Narcotics; counter-irritants	
3. — of vessels	Sedatives; derivatives; evacuants	
4. Determination to the part	Cold and other sedatives; derivatives; evacuants	For local inflammation.
5. Obstruction in the part: — by atonic enlargement	Remedies for congestion (see above)	
6. — by adhesion of corpuscles	Remedies not known; attenuants? sedatives?	
7. Distension of vessels	Counter-pressure; blood-letting; derivation	
8. Effusions	Evacuants; derivatives; operations; sorbefacients?	
9. Increased absorption	Direct remedies not known; stimulants; diminishing atmospheric pressure on the part?	
10. Impeded circulation in the part	Moist heat and other stimulants	
11. Increased circulation around	Remedies for determination (see above)	
12. Excitement of the heart	General blood-letting and other evacuants; sedatives	For inflammation with fever.
13. — of the arteries generally	General blood letting and other evacuants; relaxants (antimony, etc.); salines?	
14. Change of the blood: — by increase of fibrin	Blood letting and other evacuants; mercury; low diet	
15. — by diminution of the excretions	Evacuants; alteratives	
16. Exhaustion	Stimulants and tonics	For results of inflammation.
17. Depression from poison	Stimulants; antiseptics; evacuants	
18. Effused products of inflammation	Evacuants; attenuants; alteratives; sorbefacients? stimulants; pressure, and friction	

This table is followed by some valuable remarks on the remedies, arranged under the heads of the constituents of inflammation. In speaking of tartar emetic as a remedy of great efficacy, in inflammation with fever, Dr. Williams gives the following explanation of its action: "It seems to me, that the most reasonable view to take of its operation is, that it chiefly acts by diminishing the tonicity of the vascular system. Small doses certainly relax the pulse and skin, and, where there is no fever, produce perspiration without stimulating. They also seem to increase the biliary and intestinal secretion. In inflammation and fever, larger doses are required to produce the same result; and as soon as the excessive arterial tension is relaxed, the chief part of the fever is removed. By thus reducing the increased tonicity of the arteries, the circulation is equalized and quieted, and the determination to and distension of the inflamed part are diminished; and the vessels generally are placed in the condition for their natural offices of secretion, which their extreme tension had before interrupted. It is quite possible that this operation of antimony, and another more directly exercised on the in-

flamed vessels, may be dependent on a chemical deoxidating influence attaching to the protoxide of the metal, as before hinted at; and this notion would account for the greater tolerance of the medicine under inflammatory disease, which involves a process of hyperoxidation. These views are, however, at present, no more than hypothetical, and might, with advantage, be tested by experiments on the lower animals." (p. 338.) The remarks on bleeding, and on calomel and opium, are highly instructive; and the whole observations on treatment of inflammation and its varieties, though incapable of further analysis in the space we have at command, will well repay careful perusal.

(To be continued.)

Exposition of the Case of the Assistant-Surgeons of the Royal Navy. By a Naval Medical Officer. pp. 28. London: 1849.

A case of greater hardship than that before us, or one more imperatively calling for redress, has seldom occurred. Year after year have the assistant surgeons engaged in Her Majesty's naval service petitioned and remonstrated against the false position in which they are placed, in being compelled to inhabit, on board-ship, that noisy and most uncomfortable den, the cock-pit, in the society of lads of from thirteen to eighteen years of age. They have been mocked with the phantom of the rank of lieutenant, and are supposed to hold a corresponding position to army assistant-surgeons; but with a pettiness of spirit and disregard of justice, which is most disgraceful, the authorities at the Admiralty have systematically denied to them all the solid advantages —small as they are—to be derived from that rank. Our brethren are now making a great effort to have their just claims acknowledged; and, by being made ward-room officers, to be placed on a proper footing. Most cordially do we wish them success. If the Lords of the Admiralty do not grant this act of justice, a time will come when their conduct will be bitterly regretted. Several of the most highly educated and most valuable assistant-surgeons have already retired from the navy in disgust. There is an almost total absence of candidates for the appointment. And should this state of things continue, and a war arise, it is melancholy to reflect on the position in which our officers and seamen will be placed; either committed to the tender mercies of incompetent persons, hastily procured to meet the emergency, or going into action with perhaps a single surgeon, where the services of three would be scarcely adequate to the demand for assistance. It is after a bloody battle that the value of skilful surgeons is felt; and so, perhaps, it will yet be discovered, when too late.

On the Extraction of Teeth; with an Account of a New and much less painful Mode of Operating. By Henry Gilbert, M.R.C.S.L. London: 1849.

The object of this work is to bring before the profession and the public, an apparatus devised by the author for the extraction of teeth perpendicularly, or in the line of their axis. It consists of a chair, having a semicircular back, to receive the head of the patient. To the right side of this is fixed a steel bar, on which another bar slides at right angles, and attached to this is a flat piece of metal, which can be brought opposite to, or into, the mouth, to serve as a fulcrum for the forceps used by the operator. There is much ingenuity in the idea; but we are doubtful whether it will be found to answer in those difficult cases of curved fangs, where it is impossible to extract the teeth otherwise than by humouring them, as it were, and directing the line of force according to the situation of the resistance. Experience will show how far this particular apparatus will answer. The principle is by no means new; and instruments of various forms have from time to time been devised for perpendicular extraction, but have been laid aside as failing to attain the object desired.

THE HUMAN BRAIN; its Structure, Physiology, and Diseases, with a description of the Typical Forms of Brain in the Animal Kingdom. By SAMUEL SOLLY, F.R.S., Senior Assistant-Surgeon to St. Thomas's Hospital. Second Edition, pp. 688. London: 1847.

We remember very well the pleasure we experienced in reading the first edition of MR. SOLLY's work, in 1836. We were then fresher from the dissecting room; but now, twelve years later, with we trust maturer judgment, and a larger sphere of knowledge, the former gratification is scarcely diminished, while going over the pages of the second edition. Mr. Solly was undoubtedly one of the first and ablest pioneers, in making clear and intelligible the anatomy of the brain, as it is more generally taught. To him, perhaps, more than to any other man in this country, we owe the happy change from a mere jargon of words, to a rational and scientific nomenclature. The change in which he has been so instrumental, is, in this department of anatomy, very much like the change in botany, from the Linnæan to the natural system of study. It is an essential, as well as a nominal change. This ought to be a sufficient recommendation for Mr. Solly's labours. The following quotation is an admirable epigraph of the entire anatomical portion of the work. It is Mr. Solly's merit, that he has to a very great degree carried into execution that which he has here proposed :—"I have endeavoured, without presuming to arrogate to myself the credit of discovering any new system, to lay down a plan for the study of the anatomy of the cerebro-spinal axis, founded upon the rational basis of investigating its structure in man, by the light of comparative anatomy. The only philosophical method of simplifying and giving a character of general interest to the anatomy of the human brain, is by commencing with the structure and functions of a nervous system, in the lowest and simplest forms of animal existence, rising by degrees to the highest, carefully observing each addition of parts, and the relationship borne by these to an addition of function. By pursuing this course, we shall be rewarded by finding that the encephalon, this apparently most complicated organ in the human being, is but a gradual development from an extremely simple fundamental type on one uniform and harmonious plan, and that the seeming complexity of the cerebro-spinal axis in man, really arises from the great concentration, as opposed to the extreme diffusion of its component parts in the lower order of animals; for in no particular are the higher orders more strikingly distinguished from the lower, than in the concentration of function within circumscribed spaces." (Preface, pp. ix, x.) We can only briefly indicate the mode in which Mr. Solly has performed this task.

His First Subject is the STRUCTURAL ANATOMY OF THE NERVOUS SYSTEM, in which department he gives a good account, as far as anatomical knowledge has yet extended, of neurine in its various forms, namely, 1, the "grey, vesicular, pulpy;" 2, the "white, tubular, fibrous," and 3, the "sympathetic, gelatinous neurine." To these important subjects, in their various bearings, the first part of the volume is devoted.

In the Second part of the work, the COMPARATIVE ANATOMY OF THE BRAIN is traced, from its first appearance in the animal senses, up to its crowning development in the human cerebrum. We have the nervous centres evolved from its existence in the lowest forms of animal life. In the cryptoneura, no nervous system is discernible; in the nematoneura, the nervous system is a simple thread; in the homogangliata, all the ganglia are similar in size; in the hetero-gangliata, the ganglia are dispersed and separate; and lastly, in the myelencephala, there is the existence of a perfect brain and spinal marrow.

Parts Three to Ten are given to the HUMAN BRAIN. This is of course the most interesting part of the volume. The subjects most copiously treated of are, the protective apparatus, osseous and membranous; the cerebro-spinal fluid; the best mode of removing the brain and spinal marrow; the weight

and size of the human brain ; the description of its figurative surface, and of its cavities ; the plan of dissecting the cerebrum ; the cerebral nerves ; the cerebral circulation ; the progressive development of the human brain ; and lastly, the physiology of the cerebro-spinal axis. We give, in a brief quotation, the general results of the inquiry into cerebral physiology, which we believe to contain the expression of the best established facts of the present day upon the subject. These fundamental principles are arranged by Mr. Solly under five heads :—" 1. That vesicular neurine is the source of power. 2. That medullary neurine is the conductor of it. 3. That medullary neurine is also the conductor of those impressions, which call forth the power of the vesicular neurine. 4. That the vesicular neurine is collected in masses of variable form and size—the *ganglia*. 5. That the medullary neurine is moulded into cords and bands—the *nerves* and *commissures*." (p. 329.). Above all, in the deficient parts of the cerebral apparatus, our author places the hemispheres, under the title of "the hemispherical ganglia." Of this portion of the brain, he says, " if there is one point in the physiology of the brain more unequivocally demonstrated than another, it is that these ganglia are the instruments of the mind—the portion of the brain in which sensations are converted into perceptions, and give rise to ideas. Comparative anatomy ; developmental anatomy ; experiments on living animals ; observations on its size and form, as indicated by the size and form of the skull ; and last, but not least, pathology,—all afford a mass of overwhelming evidence, that this portion of the brain, and this only, is the cerebral organ of intellectual power." (p. 335.) The first edition of Mr. Solly's work, was purely anatomical and physiological ; but in the present edition, nearly one half of the volume is occupied with the PATHOLOGY AND TREATMENT OF CEREBRAL DISORDERS. We quote Mr. Solly's observations, explanatory of his devotion of himself, to what may seem a strictly medical subject :—" In undertaking this division of my subject, I am afraid that by some I shall be considered as stepping beyond the proper boundaries of surgical practice. To such I must observe, that every surgical disease requires more or less medical treatment ; that no surgeon is competent to treat an injury of the head affecting the brain, who is ignorant of cerebral pathology ; that the distinction between medicine and surgery is artificial ; and that a distinction between diseases arising from external violence, and from internal disease, is false and mischievous. One of the first principles instilled into my medical mind by my respected master, Mr. Travers, was the necessity of studying medicine at the hospital, with the same diligence and attention as surgery. The interest I have felt from the time I first heard Spurzheim demonstrate the brain, in 1826, has induced me to attend to the pathology of this subject, more than perhaps I should otherwise have done. These observations are made, not to prove fitness for the task I have undertaken, but simply to explain, that I do not allow that the fact of my practising as a surgeon, is any excuse of incompetency." (p. 343.) All will agree with these sentiments ; and the pathological disquisitions which follow, can produce no regret for the direction in which Mr. Solly's talents have been swayed. In his outline of the diseases of the brain, the arrangement adopted, is their division into Anæmic, Hyperæmic, Convulsive and Organic. Under these heads he discourses ably of delirium tremens, hydrocephalus, ramollissement, atrophy, apoplexy, epilepsy, and hypertrophy.

Mr. Solly's Treatise is valuable, for the clear anatomical and physiological views it contains, though we do not pledge ourselves to the entire adoption of the latter : his pathology and treatment are those of a sound and experienced physician and surgeon. The work is well illustrated with woodcuts, many of which are drawn, and some of them cut on wood, by Mr. Solly himself : and, unlike many modern works, it is accompanied by an accurate and copious index.

Cyclopædia of Anatomy and Physiology: Parts xxxiv, xxxv. Edited by Robert Todd, M.D., F.R.S. London: 1849.

These two numbers embrace a variety of subjects, extending alphabetically from secretion to sleep. In a work so comprehensive as the *Cyclopædia of Anatomy and Physiology*, we do not expect to find all the articles of equal merit: and it is therefore not surprising that some of those now before us, fall short of the proper standard. The articles most deserving of notice are, semen, by Drs. Wagner and Leuchardt; shell, by Dr. Carpenter; and skeleton, by Mr. J. Maclise.

Semen. This article affords a valuable and very elaborate account of the subject of which it treats.

Shell. Dr. Carpenter has enjoyed peculiar advantages for investigating the structure of Shell—a grant having been made to him, by the British Association, to enable him to carry out the necessary researches. We have here a summary of the results, profusely illustrated, and well deserving of perusal.

Skeleton is treated of at great length, under the archetypal theory. The researches of Professor Owen have, as is now generally admitted, demonstrated the advantages of this mode of studying the osseous system; but it must be acknowledged, that it requires a clear head and a cool judgment, to avoid running on the shoals of transcendentalism. Mr. Maclise carries the theory to its utmost extent; and we cannot help regretting that a subject, not easy of comprehension under any circumstances, should have had its difficulties vastly increased by the complex and abstruse style in which his article is written. It is overloaded with *Germanisms*: and many of the passages are so profoundly obscure, as to be far beyond the depth of ordinary readers.

Digest of several Reports on Sanitary Reforms. By Wm. Simpson, Esq., Surgeon. pp. 23. London: 1849.

The title of this pamphlet sufficiently expresses the character of its contents. Its object appears to be, to impress upon the public the non-contagious nature of cholera, and the paramount importance of cleanliness, and the removal of nuisances, of all descriptions, which by contaminating the air, generate cholera and fever. Now, that the former disease is again among us, there are hopes of parochial and other public bodies awaking from their habitual lethargy, and taking prompt and efficient sanitary measures.

Fruits and Farinacea the proper Food of Man. By John Smith. Second edition. pp. 342. London: 1849.

The object of this work is to show that the majority of mankind have been, and still are, labouring under a sort of monster delusion; that, since the Deluge, they have entirely mistaken what was wholesome food, and are suffering the melancholy consequences. We are informed that the age of man has greatly diminished since he ceased to confine himself to vegetable diet; a fact, we confess, new to us. Having taken for granted, on his own interpretation of a few words in Scripture, that, previous to the flood, "fruits and farinacea" were the sole food of the human race, the author goes on to say: "Up to this period, man seems to have derived his support from the vegetable world alone; and upon this food, his life was prolonged to vast periods of time. According to the generally-received chronology of the Scriptures, the average duration of patriarchal life, previously to the deluge, was about nine hundred years. Immediately after the flood, when animal food was permitted as an article of diet, the average period of life was reduced to four hundred years; and when Jacob lived, it had gradually declined to one hundred and fifty years. This abbreviated period of human existence may not

have been the effect solely of animal diet; but it doubtless had a considerable influence." (!) (p. 17). In this conclusion few will concur.

One of the arguments employed by the author against the use of animal food is, that "the slaughtering of animals is opposed to the exercise of benevolence and sympathy." This doctrine strongly savours of the maudlin sentimentality so much in vogue at the present day, but of which we are no advocates. Did it never occur to Mr. Smith that the Creator has wisely provided means to check the undue increase of the inferior animals, and that one means by which this is prevented is by causing them to perform a most useful, as well as important, part in the great scheme of Nature, by ministering, in the first place, to the sustenance of mankind, and subsequently by assisting in the fertilization of the earth? As well might he argue that the tiger, who tears his prey limb from limb while still alive, or the boa constrictor, who gorges animals whilst living and struggling (as we have seen), are performing acts "opposed to the exercise of benevolence and sympathy".

It is not necessary to dwell at length upon this work. We give the author every credit for earnestness in the cause he advocates, and for labour in collecting materials; but we must say that as much, if not more, might, without difficulty, be written on the other side of the question. The golden rule in diet is *Moderation*. He who eats moderately of animal food, with a due proportion of vegetables, follows that course which, in our latitudes, is pointed out by Nature, and which is best adapted to preserve health and maintain strength.

The Discovery of the Use of the Hair in the Animal Economy. By G. Calvert Holland, M.D., formerly Physician to the Shefficld General Infirmary. pp. 50. London: 1849.

The object of the author is to prove, that the great purpose intended by the Hair in the animal economy is to act as a safety valve, by carrying off any excess of nervous influence, and as a means of forming "extensive and vital relations with the great principle pervading the universe." After a careful perusal of his work, we are of opinion, that the author entirely fails to make good his propositions; it is full of fallacies, and many positions are taken for granted which are incorrect. One, for instance, is, that the quantity of hair upon an individual is in a direct ratio to the muscular development of the frame, and the activity of the pursuits. Now, any one who has had opportunities, (and ours have been considerable), of seeing men of great muscular power, must have observed, that they are as often smooth as hairy, and that, on the contrary, men of weak frames and feeble constitutions, are frequently extremely hirsute. It is to be regretted that Dr. Holland confined his observations and his reasonings to man alone; had he extended his inquiries into the wide field of comparative anatomy, he would there have found facts which would have entirely disproved many of the conclusions at which he has arrived, and, we are disposed to hope, would have caused him to hesitate before publishing a work, principally remarkable for its fallacies and fanciful theories. The selection of a homeopathic bookseller, as his publisher, betrays a consciousness on the part of the author, that the work was most likely to find favour among the credulous partizans of a sect who, apparently from a morbid mental constitution, believe in dogmas to which healthy and moderately well-informed minds cannot assent. Crack-brained doctors, and unstable dreamers, who can attribute medicinal powers to an infinitesimal fraction of a grain of coffee, may adopt as truth Dr. Holland's *Discovery of the Use of the Hair:* but among sober men of science, his views can find no advocates. Had this little book not been the production of the author of a really instructive treatise on *Diseases of the Lungs from Mechanical Causes*, which was most favourably received by the profession, we would not have troubled our readers by recording as our opinion of the present performance, that it is quite unworthy of its author.

CRITICAL DIGEST OF THE BRITISH AND FOREIGN MEDICAL JOURNALS.

PRACTICE OF MEDICINE AND PATHOLOGY.

DR. W. T. GAIRDNER'S MEMOIR ON THE PATHOLOGICAL ANATOMY OF CHOLERA.

Dr. W. T. Gairdner, Pathologist to the Royal Infirmary of Edinburgh, has published, in the *Monthly Journal*, an interesting and valuable summary of the morbid appearances found in the bodies of persons dying, at Edinburgh, from Cholera. We fully recognize the importance of such observations: but it is obvious, that the pathology of an intensely toxæmic disease, like Cholera, in which rapid death so frequently follows the seizure, can only be learned by an examination of the blood itself, and of the evacuations. It is encouraging to observe, that although a too exclusive solidism still prevails, that exclusiveness is daily diminishing. However, until a greater number of well-trained and competent observers devote themselves to the chemical and microscopical investigation of the fluids, no truly great discoveries can be looked for in Pathology, and no signal improvement can be achieved in Rational Therapeutics.

In a modified sense, the following remarks of Professor Webb of Calcutta, are true, without any limitation as to disease or climate, but they are entirely applicable to Cholera. The older physicians, we must now admit, were not very far wrong, when they asserted that diseases generally originate in the blood, and that the effects on the nervous system, and the structural alterations in the solids, are in truth secondary affections. "In the majority", says Dr. Webb, "of the most fatal diseases of India, morbid anatomy, if restricted to the solids, would not explain anything adequately. If we take some of the most common, and most rapidly fatal diseases, and carefully investigate their nature through the medium of their morbid anatomy—take rapidly fatal fever, that destroys in twelve hours—take Cholera, that destroys in six or seven hours—take land or sea scurvy, in which, without pain or sickness, patients occasionally drop down dead; lastly, take *coup-de-soleil*—or take *delirium tremens*, most carefully scrutinizing the morbid appearances—nothing in the solids of the body presents itself which you can regard as essential to such diseases, yet they all strongly resemble each other in these two characteristic features—enormous congestion of blood, and the fluid condition or altered nature of the blood. Every other feature may vary in every one of them; but the alteration in the blood is invariably found." (Webb: *Pathologia Indica*, 2nd ed. p. 17.)

The summary given by Dr. Gairdner ought to have been accompanied by a report of some individual cases: those characterizing groups being given with every minute detail, and the rest in an abbreviated or tabular form. We hope that Dr. Gairdner will still publish the cases, and enable his fellow-labourers to analyse the various facts for themselves. Some of the conclusions arrived at by Dr. Gairdner might then be better understood: for example, we are at present in difficulty as to the remarks on congestion. Congestion is assuredly the essential character of a stage of Cholera: and no general statement as to the presence or absence of this condition is of any value, unless accompanied by an analysis of the cases, mentioning the duration of the disease when death occurred, the leading symptoms, and the treatment adopted. The account given of the condition of the kidneys is very interesting: but we would have liked, in supplement, a precise numerical statement, embracing the points of each case, as now suggested. In the first hour of a choleraic diarrhœa, the urine will be found albuminous: but were the patient to be then

suddenly cut off, nothing would be found in the kidneys beyond great congestion. How valueless, nay, how deceiving, would be an undigested summary of the morbid appearances found in the kidney after scarlatina! Unless, along with the anatomical appearances in each case, we had information as to the exact duration of the attack, also an account of its leading symptoms and treatment, we should have most unsatisfactory data upon which to found any conclusions. For example, if a patient be cut off at an early stage of scarlatina, even though there have been anasarca and albuminuria, we only find the kidneys congested; but in those who, after weeks or months, die dropsical, and who have had albuminous urine, these organs are invariably found in a more or less advanced stage of degeneration, from the deposition of morbid matter. Again, if a Cholera patient die at the end of a long typhoid stage, very probably an analogous if not similar condition will be found.

We throw out these remarks, in the hope that Dr. Gairdner will yet supply the whole of the valuable information which he possesses regarding the Pathology of Cholera. Rarely does it fall to the lot of an observer so thoroughly competent to have such ample scope for the study of this disease; and we feel assured, that the readers of the *Edinburgh Monthly Journal* would not grudge to one of its editors the necessary space for a series of articles on so important a subject. There are some important topics, to which the author does not even advert; and, as a very remarkable omission, we would mention that nothing is said as to the condition of the lungs. Our high sense of the value of the present memoir has suggested these remarks; and induced us to reprint it entire, with its accompanying foot-notes.

Dr. Gairdner's Memoir.—"The following statement is founded on the examination of eighty-nine fatal cases of Cholera, during the late epidemic, in the theatre of the Royal Infirmary of Edinburgh. In the course of my duties as pathologist to that institution, I have had unusual opportunities of contrasting and comparing the appearances in Cholera with those presented to my notice in connexion with other diseases; and the constant use of this *comparative* method of observation has led me to consider many statements as erroneous, which are generally—and in some cases all but universally—received in relation to this disease. The greatest care has been taken to verify or correct the results obtained by previous observers, more especially where any theory of the disease appeared to be involved; microscopical analysis and chemical tests have been applied wherever they promised to aid in the investigation; and in regard to such doubtful points as appeared likely to acquire precision by numerical analysis, the results have been preserved in the tabular form.

"The bodies opened were mostly from the Cholera hospital, being taken at random from those who died under the care of Dr. W. Robertson; a few, however, were from the infirmary. The proportion of females to males was two to one. The average age of the patients was thirty-three, by far the greater number being between twenty and forty. Four of the females were in different stages of pregnancy; but as the greater number of the bodies of females, known to be pregnant, were given to Mr. Goodsir by his special request, this number does not give an accurate idea of the large proportion of pregnant cases. Several of the females had been nursing, as was shown by the distended mammæ, which readily yielded milk on pressure. The great majority of the bodies examined were evidently those of persons previously healthy and vigorous. They presented the external appearances, so well known in Cholera, of lividity and collapse, the last being caused by the shrinking of the cellular tissue from the absorption of its watery parts; there was, however, no diminution of the fat, which was usually in very considerable quantity on the abdomen and elsewhere. The muscles were of good colour, and usually in strong tonic contraction from the *rigor mortis*. The

more important facts, resulting from the examination of the internal organs, are embodied in the following conclusions :—

"I. *Previous diseases of those attacked.* Cholera appears, during the late epidemic, to have attacked chiefly persons in health, or in the retrograde stages of chronic affections, and to have spared almost entirely those affected with acute or actively progressive disease. Appearances of acute disease were chiefly observed when death took place after more or less distinct reaction, and were evidently the *sequelæ* of the choleric affection. The chronic lesions were exactly similar in kind to those most commonly found in hospitals and dissecting-rooms, but bore a decidedly lower proportion than is usual to the whole number of cases examined. Thus the lungs had the traces of old disease in one-sixth of the cases ; among which, two only (cases of miliary tubercle) indicated progressive disease. The liver presented a chronic lesion in one case ; the kidneys in four, of which only two (incipient Bright's disease) were progressive. The uterus and ovaries were frequently more or less abnormal ; but the only progressive lesion was ulceration of the cervix, usually quite superficial. The intestines were uniformly exempt from chronic disease. It thus appears that the opinion which has been so extensively prevalent since 1832, that Cholera attacks chiefly or exclusively individuals of unsound constitution, or bearing the traces of previous organic disease, is not borne out by the facts of morbid anatomy ; and, in particular, that there is no evidence whatever that previous disease of the intestinal canal predisposes to Cholera.

"II. *The Blood* is much less affected in its physical characters than is usually supposed to be the case in Cholera. Its coagulation within the vessels takes place much as in other diseases. In the majority of instances, firm clots are found within the heart, more or less completely decolorized ; and the serum or non-coagulated portion contains the greater part of the blood corpuscles. The colour of the blood presents nothing unusual, the epithets 'dark' and 'venous,' being in no degree more applicable to Cholera blood after death, than to that of every ordinary form of fatal disease. The remarkable viscidity of the serum (or portion of the blood not involved in the clot) so often noticed, was chiefly observed in cases fatal during the collapse or early reaction ; and was certainly owing to the removal of the fluid matter by the intestines. The effect of this in modifying the chemical constitution of the blood has been fully shown in Dr. Robertson's researches (*Monthly Journal*, May, p. 764). The microscopic appearances of the blood presented nothing unusual.

"III. Much importance has been attached to *Congestion* in relation to the pathology of Cholera. But it is an error to conceive congestion as an essential or universal condition in this disease ; for, although the lungs and right side of the heart are frequently loaded with blood to a considerable extent, the liver, spleen, and kidneys are, in most cases, paler than is usual in other affections. The intestines present every shade of colour, from the palest to the deepest. The uterus and Fallopian tubes are generally loaded with blood. The venous system of the brain, and indeed the great veins generally, are also in most instances full. But such appearances are very common in other forms of fatal disease.

"IV. A tendency to *Ecchymosis* in various situations was certainly characteristic of Cholera to an extent not common in other fatal diseases. These ecchymoses seldom occurred externally, except in one situation, viz., beneath the conjunctivæ of the eyes, which were very commonly more or less bloodshot. Among the internal organs, it was more frequent on the intestinal mucous membrane, especially of the colon, than in any other situation ; but very frequent also in the form of petechiæ, on the posterior surface of the heart, and occasionally in other places, as the cellular tissue surrounding the cervical vessels, and in that around the dura mater of the spinal cord. Perhaps there were other situations in which ecchymoses might have been found on examination ; but in the above it was so frequent, that in only six, out of twenty-six cases, was it not found in one or more of them.

"V. The *Glandular Secretions* in Cholera, are probably more or less diminished in quantity (although there are no very precise observations on this point); and they appear also, from the observations of Dr. D. Maclagan[1] on the milk, and of Dr. J. W. Begbie, and other observers, on the urine,[2] to undergo great alterations as to quality. But with the exception of the urinary secretion, which in the collapse appears to be nearly, if not altogether suspended, there is no evidence that any of the more important and constant glandular secretions are suppressed in any stage of this disease. The milk could be readily expressed in streams from the ducts, even after death, in nursing women. All the other glands preserved their natural appearance and structure, and the lymphatic and mesenteric glands contained a secretion, which presented the normal microscopic elements.

"Next to the suppression of urine, the suppression or retention of the bile has been assumed (on account of its apparent absence in the dejections) to be one of the most characteristic features of Asiatic Cholera. The assertion that the bile is suppressed, however, is obviously incorrect; and it is only wonderful that this idea has not met with more positive discouragement by pathological writers. In the late epidemic, in every instance, except two, the gall-bladder contained more or less bile, which was mostly of good colour or consistence; and, in the greater number of instances, in quantity sufficient to produce considerable distension. One of the exceptional cases was the one formerly referred to, of diseased liver, in which the gall-bladder contained only a thin light-coloured fluid; in the other, abundance of bile was present in the duodenum and stomach. The gall-ducts were most frequently empty, but occasionally contained bile; a probe passed in all cases easily from the duodenum to the gall-bladder, being usually somewhat tightly grasped at the neck of the latter, as is invariably the case, whatever be the cause of death.[3] The duodenum contained, in most cases of collapse, no appearance of bile; but there were, nevertheless, several cases in which the characteristic green colour was present in greater or less amount in the contents of the duodenum and stomach, though not in those of the intestines generally.

"It appears, therefore, clear, that the non-bilious character of the evacuations cannot be due to non-secretion. It must, therefore, be ascribed to retention of the secreted bile in the gall-bladder. But it may well be doubted whether this retention can be rightly regarded as any part of the pathological process in Cholera. The quantity of bile which passes into the duodenum, under ordinary circumstances, in the absence of the natural stimulus of food, is probably very small; and the quantity which appears in the fæces in the normal state, or even under an ordinary attack of diarrhœa, would be quite insufficient to tinge visibly the enormous quantity of fluid thrown off by the intestines in Cholera. Further, the examination of the Cholera dejections chemically shows, that biliary colouring matter can frequently be discovered in them by the nitric acid test, when it is not appreciable otherwise;[4] and it is fully proved by the *post-mortem* appearances,

[1] "See Dr. Robertson's account of the Practice in the Cholera Hospital, in the *Monthly Journal*, Dec. 1848, p. 394.

[2] "Dr. J. W. Begbie has made a very extended series of observations on the urine voided in the earlier periods of reaction, from which it appears that the urea is generally much diminished, and in some instances entirely absent; and that albumen is almost invariably present, in greater or less amount, together with epithelium, for a variable period after the commencement of reaction. The presence of albumen was noticed at a very early period in the Edinburgh epidemic, and has since been extensively observed in the Parisian hospitals. Dr. Begbie also informs me, that various other modifications of the urinary secretion have been observed by him; in particular, a reaction with nitric acid indicating the presence of bile.

[3] "This constriction at the neck of the gall-bladder is probably due to an elastic tissue. It has been frequently mistaken for *spasm* of the gall-ducts; a condition which I believe, *as far as post mortem examinations are concerned*, to be purely imaginary.

[4] "Dr. Parkes seems to doubt whether the matter indicated by this reaction is bile; but

that bile is occasionally found in appreciable quantity in the duodenum during the collapse state (though to a more considerable extent during the reaction). From these circumstances it seems probable that the secretion of the liver is discharged into the intestines in Cholera, to quite as great an extent as in most diseases in which digestion is totally interrupted, or as in a healthy individual when fasting; and that its ceasing during the collapse to colour sensibly the dejections, is the consequence of its extreme diffusion through the mass of fluids in the intestines.

"Repeated microscopic examinations of the liver revealed nothing unusual. The kidneys, however, appeared in many cases to have undergone morbid changes, the cortical substance being pale and turgid, and the tubuli uriniferi gorged with imperfectly developed epithelium, which was mostly loaded to an unusual extent with oleo-albuminous granules. A similar state of the kidneys occurs after scarlatina, and not unfrequently after typhus fever, and some other acute diseases.[1]

"The secretions of the serous membranes appeared to be diminished in quantity, and everywhere more viscid than natural; an effect probably of the altered constitution of the blood.

"VI. *The condition of the Intestinal Canal and its Secretions* demands special notice. The most frequent of all the abnormal conditions of the mucous membrane was the prominence of the intestinal glands, both aggregated and solitary, but especially the latter. This condition, the *psorenterie* of some French writers, was found in about two-thirds of the cases. The great frequency of patches of ecchymosis in the intestines, especially in the cæcum, has been already alluded to; in these cases the intestinal contents were usually more or less tinged with blood, and presented blood-corpuscles, among their other elements, under the microscope. The ecchymosed patches were distinctly circumscribed, in tint varying from claret colour to the deepest purple, approaching black, but in parts not unfrequently greenish or ash-coloured; their surface presented a similar appearance, in all but colour, to the rest of the mucous membrane, and was not perceptibly elevated. In three instances, however, a different appearance was observed in the colon, the mucous membrane presenting a few flattened elevations, each over the extent of about a sixpenny piece, of a greyish or leaden colour. These elevated patches were evidently due to a sub-mucous exudation (probably identical with the diphtheritic exudations described as occurring in Cholera by Virchow), and yielded on section a creamy fluid; in this fluid, microscopic examination showed no well-marked pus-corpuscles or complete cells, but a number of nuclei, on which acetic acid produced no effect. In one protracted case, in which the great intestine was much ecchymosed, there were traces of dysenteric lymph on several parts of the mucous membrane. In two other instances, there was distinctly exudation of yellowish lymph, with heightened vascularity on the external serous surface of several folds of small intestine.

"On the other hand, it was by no means uncommon, especially in early fatal cases, to find the intestines throughout natural in colour and appear-

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neither does he admit it to be uric acid, the only substance which has been alleged to have caused confusion. The principal reason stated for his scepticism is, that 'that there is a remarkable retention of this product (bile) in Cholera, as in dysentery.' It will be at once obvious that this is the very preconception against which I am arguing. See the London Journal of Medicine, Feb. 1849, p. 143.

[1] "I am indebted to my friend, Mr. Alexander Borthwick, now in Dumfries, who studied along with me very carefully the condition of the different organs in Cholera, as compared with the miscellaneous cases which came under our notice, for tabular statements which show, quite satisfactorily, the much greater comparative prevalence of an excessive quantity of oleo-albuminous exudation in the kidneys of Cholera patients, than either in the liver or the heart, which were in this respect below the average. None of these cases, however, with the exception of those alluded to in a former part of this communication, presented the granulations of Bright, or any other unequivocal marks of a chronic disorganization.

ance, or even paler than natural; and in many of these cases there was no prominence of the solitary glands.

"The intestinal contents resembled closely, at first sight, the well-known Cholera stools. In their most characteristic appearance they were yellowish-white, but frequently acquired, from blood on the one hand, or bile on the other, various shades of orange and greenish colour. On microscopic examination, the intestinal contents invariably showed immense quantities of perfect epithelium, sometimes in coherent masses, peeled from the mucous membrane, and preserving the form of the villi and follicles to which it had been attached. The existence of epithelium in the fluids found in the intestines in Cholera, has been noticed by Boehm (see *Medical Times*, June 24, 1848) and other observers, and has been supposed to indicate a complete desquamation of the intestinal epithelium as one of the special pathological conditions of Cholera. In reality, however, the appearance proves precisely the reverse; for the presence of epithelium, in such large quantities, in the fluids found in the intestines after death, is the result of purely mechanical maceration upon a mucous membrane to which, during life, the epithelium remained attached. That this is the case is proved by these facts: 1st. That artificial maceration produces a similar result on a healthy mucous membrane; 2nd. That the epithelium found in the fluids of each division of the intestines, is always that of the particular part where it is found; 3rd. That the true Cholera stools, *passed during life*, contain so little perfect epithelium, that it cannot be considered as anything more than an accidental ingredient.[1]

"The examination of the Cholera stools leads to much more important and less confusing results than that of the intestinal fluids after death. These discharges separate by filtration, or on standing, into a colourless, or slightly coloured fluid, of an alkaline reaction and a flaky sediment. The former is usually of a specific gravity, from 1005 to 1010, and contains, therefore, a very small proportion of solid matters; these have been shown by Dr. Parkes to consist chiefly of salts. Repeated examinations of this fluid have shown, during the late epidemic, (as Andral showed in the former,) that albumen, as tested by heat and nitric acid, is not necessarily present in it. Indeed, the presence of albumen usually coincided with that of a small quantity of blood, which, as before mentioned, is frequently present. The fluid, however, contains *constantly* a small quantity of an organic substance which is precipitated by alcohol, by corrosive sublimate, and (when acidulated) by ferrocyanate of potash; and which presents, in other respects, the chemical reactions of mucus.[2]

"The flakes which form the sediment of the Cholera stools, have likewise the ordinary chemical reactions and physical properties of mucus. They are, however, opaque and turbid, and when submitted to the microscope, show a hyaline finely-striated basis, involving numerous granules, nuclei, and cells. The granules and minuter molecules require no particular description. The nuclei are from 1-250th to 1-180th of a line in diameter, circular or slightly oval, and not affected by acetic acid. The cells are comparatively few in

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[1] "A similar conclusion, in regard to the desquamation of epithelium, has been maintained by Dr. Parkes, in an elaborate article on the *Intestinal Discharges in Cholera*, in the London Journal of Medicine for February last. Although there are many opinions in Dr. Parkes' paper from which I differ, it affords me much gratification to observe, that the principal facts included in the description of the Cholera-masses by himself and his colleagues, correspond so nearly with what I have myself observed.

[2] "M. Mialhe calls his substance *albuminose*, and considers it as "the ultimate product of the digestion of albuminous substances" (see *L'Union Médicale*, 5th April 1849). His pathology of Cholera is founded on the alleged presence of albuminose in the blood, which assertion, however, he does not appear to have attempted to establish by experiment. I prefer, therefore, the more familiar term of mucus, which is perfectly applicable to this substance, and was used by Andral, to one which is associated with a very doubtful hypothesis. The nearly allied chemical relations of mucus and the protein compounds are well known.

number, mostly globular, seldom exceeding 1-150th of a line in diameter. Some of them are but little affected by acetic acid, and single-nucleated; others present all the appearances of perfect pus cells, being two, three, or even four-nucleated, and having the cell-wall rendered very transparent by acetic acid. The most common appearances, however, were the nuclei without cells, above mentioned.

"Any one who is familiar with the pathological phenomena displayed by mucous membrane, in a state of irritation, will readily recognize the similarity of the above microscopical appearances to those of ordinary catarrhal discharges from any of the mucous surfaces of the body; the chief peculiarities of the choleric fluid being the enormous exaggeration of the watery and saline matters evacuated, and likewise the smaller tendency to the discharge of albumen, and the development of pus-corpuscles, which are so readily formed and thrown off from a mucous membrane in a state of ordinary irritation.

"The effects upon the blood of the removal of the watery and saline constituents, are well shown in Dr. Robertson's analyses; and it is probable, that a considerable amount of the albumen of the blood also passes away by the intestines, in the form of mucus, which is nearly allied to it in composition, and which, as has been shown, forms the organic basis of the choleric evacuations.

"VII. The *Nervous System* presented no lesion worthy of remark. The pia-mater of the brain and spinal cord were often considerably injected, especially that of the cord, which, from the position of the body after death, almost always presents this appearance. The spine was, however, only opened in four cases; and in one of these, there were found small calcareous plates upon the arachnoid of the cord—the most frequent, probably, of all its chronic lesions. The sympathetic ganglia and the pneumo-gastric nerves were repeatedly examined; but nothing unusual, except, in a few cases, slight ecchymosis, was discovered." [*Edinburgh Monthly Journal* for July 1849.]

RAIKEM ON THE PATHOLOGICAL ANATOMY OF CHOLERA.

M. Raikem has communicated to the Belgian Academy of Medicine the following Anatomo-pathological researches on Cholera. His observations were made on persons who had died before reaction had commenced; this it is important to bear in mind, as the pathological changes of that period are different from those which occur in the stage of reaction. In the former, there are none of the characters of inflammation; in the latter, they are often present.

I. External State of the Body. In general, the animal heat continues longer than usual; but in no case has it appeared to rise immediately after death to a higher degree than during the agony. I have never seen spontaneous movements in the dead bodies of Cholera patients, either in the limbs or lips; but a hospital pupil and several patients have told me that they witnessed such phenomena in two cases. The face was pale, sharp, and exhibited muscular contractions, so that the angles of the mouth were elevated, and the mouth was partially opened; this was observed more on one side than on the other. At the moment of death, all the limbs became stiff. This stiffness lasted some days, even when putrefaction had commenced in the anterior walls of the abdomen, and the splanchnic cavities had been opened more than forty-eight hours. It was accompanied by hardness and very distinct muscular markings, by extension of the foot, and by a very powerful contraction of the fingers on the thumb, which returned immediately after they had been, with great difficulty, extended. In most cases, the nails and fingers were in a state of cyanosis. This livid tint had its seat in the subjacent vascular tissue; and—which is a remarkable circumstance—pressure on these parts produced paleness, succeeded by a return of the colour when it was removed, just as is observed in Cholera patients during life. This experiment serves to show that the black blood with which the cutaneous capillaries are engorged, is still in a liquid state, so as to be capable of being easily dis-

placed. The disappearance of the cyanosis, from many parts, immediately after death, seems to prove the same thing.

II. Head. The arteries on the surface of the encephalon usually contained a little black thick blood, easily seen through their semi-transparent coats. The venous sinuses, especially the lateral, as well as the veins beneath the arachnoid, often contained some black, viscous, semi-coagulated blood. I once observed bubbles of air in one of the venous ramifications, in a patient who had died on the fifth or sixth day of the disease. There was, as yet, no evidence of decomposition, and the animal heat remained, although more than thirty hours had elapsed since death. Slight compression on the walls of the right ventricle of the heart, caused the escape from some divisions of the jugular veins, which had been opened, of bubbles of air, and frothy blood, in large quantity. Bubbles of air have been sometimes observed to escape, with the blood, from the vein of a Cholera patient, opened during life; and several physicians, worthy of credit, among whom is Professor Spring, have often found an aëriform fluid in the cerebral veins of individuals who had died of Cholera. The cerebral substance presented no constant alteration; I always found, however, the choroid plexus, the velum interpositum, and the veins of Galen, gorged with blood. The upper part of the spinal cord appeared, in most cases, more firm than usual.

III. Thorax. I have always found the walls of the right ventricle of the heart in an extraordinary state of flaccidity and relaxation, while the left ventricle was more or less contracted. The right auricle was very full of dark blood, frequently clotted; the right ventricle contained much less. The left cavities contained only a very little blackish thick blood, more liquid than in the right side. It may hence be presumed, that the functions of the heart ceased with the diastole of the right, and the systole of the left ventricle.[1] The venæ cavæ, the azygos, intercostal, and mesenteric veins, etc., usually contained more or less dark thick blood; but the latter veins were frequently flabby and weakened, containing less blood than their calibre would hold, and presenting no appreciable change of their walls. I have pretty often found in the arteries a little dark blood, especially in the aorta and carotids. The interior of these has several times appeared of a rosy tint, while the internal coat was softened and capable of being easily raised, bringing to view a number of small whitish striæ, formed by atheromatous matter, in the subjacent cellular tissue. The lungs were generally more or less collapsed, leaving an interval of two or three inches between their anterior surface and the costal pleura. Their anterior surface was uneven; their substance felt like marrow, and crepitated but little. They were light, and almost exsanguine in the greatest part of their extent, except in their posterior and inferior part, which was the seat of slight sanguineous engorgement, and presented a more or less deep red colour. These viscera were often also emphysematous, retaining the impression of the finger. They were of a much lower specific gravity than water, and had no mucus nor froth in the bronchial tubes, and only contained an appreciable quantity of blackish blood in the vessels of the posterior and inferior portions. I have never met with tubercles in the lungs of Cholera patients; however, in one case there was tuberculous matter in the bronchial glands, and in the submucous cellular tissue of the ileum. Nor have these viscera ever presented traces of inflammation. However, in a young woman who died on the fifth day, and who presented on the fourth some symptoms of pleurisy, followed by hæmoptysis, I met with a sort of splenization of the inferior lobe of the right lung. This lesion was to be referred, I think, to hæmorrhagic congestion, with sanguineous effusion into the pulmonary vesicles, the minute bronchia, and the cellular tissue of the organ.

[1] In a report read to the Académie de Médecine of Paris, in December 1831, it is stated, that the heart, in the bodies of Cholera patients, never presents the same persistence of contraction as the muscles of the limbs.

IV. Abdomen. The liver was slightly gorged with dark thick blood, but presented no remarkable alteration. The gall bladder was usually distended with bile of variable colour and consistence. I have several times found biliary calculi. Another time, its walls were opaque, whitish, thick, studded with highly-developed hyperæmiated vascular ramifications, and contained a large quantity of a clear limpid fluid, holding mucosity in suspension. Analogous observations have been made by a celebrated French physician, in Cholera patients. The portal vein contained little or no dark blood; its walls were collapsed, and presented no apparent alteration. The spleen, in no case, appeared to me softened and gorged with blood. It was not uncommon to find the mucous membrane of the stomach presenting, here and there, hyperæmiated and well-developed villosities, a more or less distinct dotting, or an arborescent injection with softening in various stages. In one case, that of a tanner who suddenly fell ill on the 27th of March, and died in twenty hours, I observed a circumscribed portion of the mucous membrane of the large end, to be of a greyish colour, very much softened, without any trace of organization, detached from the surrounding tissues, and exhaling a repulsive odour;—an alteration which I considered as a slough. The stomach, but especially the intestines, almost always contained a whitish creamy matter, less thick in the small than in the large intestines, and containing small grumous particles of the same colour. In three cases, these were replaced by whitish flocks, formed of very distinct *débris* or *detritus* of disorganized fibres; this happened in cases where a more or less extensive portion of the mucous and muscular coats of the intestinal tube had been destroyed or mortified, in consequence of a non-inflammatory pultaceous softening. The liquid was occasionally sanguinolent, or tinged yellow with bile, which seldom appeared in any great quantity in the duodenum and other small intestines. I have often met with lumbrici, but only once with a tricocephalus in the cæcum, a small entozoon which may be found in most subjects, of whatever disease they die. The internal surface of the intestinal canal was coated with a layer of thick glutinous mucus, or with a white creamy matter. Most frequently, it presented a more or less intense diffused redness, and a more or less marked arborescent injection. In these cases, I easily succeeded in producing paleness, by passing my finger several times over the hyperæmiated portions. This confirms the experiments of M. Magendie on the permeability of these vessels in Cholera patients, and shows the absence of inflammation. The mucous membrane of the intestines was sometimes pale, colourless, and thin, and exhibited vascular scattered ramifications through the sub-mucous cellular tissue. It was frequently covered, especially in the lower part of the ileum, with round whitish corpuscles, about the size of a hemp or millet seed, or even smaller. These corpuscles, more or less numerous, had a certain degree of hardness, and were raised above the level of the mucous membrane, rendering it rough to the touch. I have never met with them in the stomach; but it was not rare to find them scattered over the whole surface of the intestines, even on the spaces occupied by the glands of Peyer. The base of these corpuscles was of a pearly white, and surrounded by a sort of areola of hyperæmiated arborescent vessels. I rarely found them flattened, and with a distinct aperture in the centre; some of them appeared deprived of epithelium, and superficially ulcerated at their summit. When they were separated from the intestines, and punctured with a lancet, I was able to press from them a milky liquid, analogous to that found in the intestines. As these corpuscles are found indiscriminately in all parts of the intestines, it seems that they cannot be attributed to a morbid hypertrophy either of the glands of Brünner, which are peculiar to the duodenum, or of the glands of Peyer, which are found only in a certain part of the small intestines, but to an histological element common to different points of the intestinal canal. From the characters which they present, I suspect that their seat is in the closed capsules, or soli-

tary follicles without an aperture, which are found scattered throughout the intestines. The villi of the small intestines were commonly more developed than usual, and of a whitish colour. I have twice found the ileum without traces of inflammation, covered with ulcerations of more or less depth, with ragged edges, resting on the muscular coat, and in some places on the peritonæum, with softening of the surrounding mucous membrane. This had, in a more or less considerable extent, been in some way destroyed or liquefied, so that there only remained the peritonæal coat, covered by some remains of the superjacent tissues. The intestinal walls, then, viewed through day-light, resembled thin gauze, being semi-transparent, and very easily torn. In another case, that of an armourer, aged 26 years, subject to epilepsy, who had been ill only a few hours, the cæcum and a part of the colon were found attacked with a similar morbid erosion of the mucous, cellular, and muscular coats, without any appearance of hyperæmia or inflammation, even in the peritonæal membrane. I have sometimes met, here and there, with circumscribed ecchymoses and a sort of sanguineous infiltration, in the fatty vesicles situated between the layers of the epiploon and mesentery. The mesenteric glands were commonly a little swollen, firm, of a rose-colour; and, when cut into, allowed some serous liquid to exude. I have never met with intestinal invaginations in Cholera patients; the colon has, however, occasionally presented permanent contractions. Each time that I have made a careful examination of the superior cervical and semilunar ganglia, by placing thin slices of them on plates of glass, I have recognized with the naked eye, and still better with a powerful lens or with a microscope, a more or less marked arborescent vascular hyperæmia, often accompanied by small, sometimes by considerable ecchymoses, in their substance. The bladder was commonly empty, contracted, and lined with a whitish creamy matter; in one or two cases I was able to obtain some urine.

Remarks. Death, in Cholera, has been attributed to paralysis of the brain—*apoplexy;* to paralysis of the lungs—*asphyxia;* to paralysis of the heart—*syncope.* I am not disposed to admit the existence of paralysis of the solar plexus. Paralysis of the principal foci of life may occur either suddenly or gradually. Whatever may be the cause of death in the concatenation and succession of phenomena which precede it, I think with some others, that there is a moment when it commences either in the heart, in the lungs, or in the brain. But which of these organs is it that first loses life, or functional activity, in Cholera patients? It is not probable that the action of the brain ceases before that of the lungs and heart. In fact, the patient preserves his intellectual, moral, and affective faculties entire, up to the last moment; and the cerebral functions are least deranged in the course of the disease. It is generally admitted that Cholera patients die of asphyxia. But when I reflect on the anatomical characters of asphyxia—voluminous, distended, inflated lung, heavier than usual, of a dark violet colour in its whole extent, gorged with dark fluid blood, and having the bronchia filled with a frothy liquid, etc., while in Cholera patients it is collapsed, light, more or less exsanguine, with no froth in the bronchia, etc.,—I am authorized in saying that anatomo-pathological facts do not support the idea of asphyxia in Cholera. Such an idea is also opposed by the non-persistence of the contractility of the fibres of the heart, as well as by the phenomena presented by the circulation in the course of the disease, which tend to shew that the central organ of the circulation is primitively affected with inertia and want of power. I would then adhere to the opinion of those who consider that death begins from the heart. When syncope terminates various diseases, said the immortal Bichat, we constantly observe the lungs almost entirely empty; they are not gorged with blood. If no organic disease have pre-existed, they are collapsed, occupying only a part of the thoracic cavity; and retain their proper colour. [*Gazette Médicale de Paris,* 7th July 1849.]

SUPPRESSION OF URINE.

The toxæmic effects of partial or total Suppression of Urine, have been recently brought before our readers in Dr. Cormack's communications, p. 451-462, 522-537, and also in a paper by Dr. Oke, abridged from the *Provincial Journal*, at p. 580. More recently, Dr. J. C. Hall has treated of the subject in three papers, in the *Lancet* of June 2nd, June 16th, and July 7th. The following is the substance of his interesting papers : —

Case I. March 18th, 1840. I was requested to visit Joseph L., rather below the middle height, stout, very "thick-set," with short neck, and florid complexion. He complained of heavy dull pain at the pit of the stomach ; his bowels were disordered, as he supposed, from eating, the evening before, a quantity of new bread ; he had been drinking for some days a larger quantity of strong ale than usual. The tongue was moist, and coated ; urine high-coloured (but not less than usual), no headach ; has of late been exposed a good deal to cold and rain. I ordered an ounce of castor oil, with m. xx. of tincture of opium, in a little warm gin-and-water. He came to me in the evening, saying he was no better ; the bowels had only acted once, slightly ; "does not think the pain and uneasiness quite so severe as in the morning." I ordered, extract of colocynth. eight grains ; chloride of mercury, two grains. To be made into two pills, and taken directly.

19th. I saw him at *nine* A.M.; his face was flushed ; tongue coated ; pulse 100. He had felt better until this morning. At seven o'clock, feeling uneasy, he got up to make water, and could only pass a few drops ; had not made water for the last eighteen or twenty hours. On the introduction of the catheter, not a drop of urine came away. On examining him more closely, he said the pain in his back was at times severe, succeeded by a dull, heavy, continued uneasy sensation, not amounting to actual pain—to use his own words, "the small of my back is half broken." He was generally out of sorts, the eyes heavy, pupils considerably dilated, and sluggish. When questioned, he said he "was not without pain in his head ;" he "was drowsy, and would go and get some sleep, for bed was the best place for him." The skin was dry and hot. Bled to sixteen ounces. Blood dark and tarry ; has had a motion which exhibits a deficiency of bile. To drink freely of linseed tea, as he complains of thirst ; to have a warm bath, and to put mustard poultices to his feet. To take—calomel, eight grains ; powdered cantharides, a grain ; croton oil, four drops ; extract of hyoscyamus, four grains : mix for four pills, one to be taken every three hours. Sesquicarbonate of soda, a drachm ; nitrate of potass, a drachm ; spirit of juniper, two drachms ; tincture of squill, a drachm ; tincture of cantharides, a drachm ; camphor mixture, five ounces and a half : two table-spoonsfuls to be taken every four hours. Oil of turpentine, half an ounce ; compound tincture of camphor, half an ounce ; soap liniment, half an ounce : mix for an embrocation. This was well rubbed over the loins every hour. *Three o'clock.* Has been purged twice ; has not passed any urine ; complains of pain in the head, and a dull, heavy sensation in the loins ; pupils dilated. Apply a large blister to the loins. *Six* P.M. ; pupils more dilated ; has wandered a good deal at times ; lies in a half unconscious state, and when roused, answers in a quick, sharp manner. *Eight o'clock :* no better ; pupils much dilated. When asked how he feels, says "he does not know, but thinks he is not bad enough for me to come so often." *Twelve o'clock :* much the same ; has had two more evacuations ; no urine has passed, nor is there any in his bladder.

20th. *Ten* A.M. Has passed a bad night ; face flushed : pupils dilated ; complains of thirst ; pulse 90. Two ounces of urine were drawn off by the catheter ; this is all he has passed for forty-two hours. Ordered, James's powder, four grains ; chloride of mercury, two grains ; mix for a powder, to be taken immediately. Spirit of juniper, two drachms ; sulphate of magnesia, an

ounce; wine of colchicum seeds, two drachms; peppermint water, eight ounces: mix. Two tablespoonfuls every four hours. Bitartrate of potass, an ounce; lemon juice, an ounce; refined sugar, an ounce; essential oil of lemon, ten drops; boiling water, two pints: mix for an ordinary drink, when thirst is urgent. *Evening, Nine o'clock.* Has passed about three ounces of urine (high coloured and strongly acid) since morning; less pain in the head; bowels freely opened; skin moist. Potassio-tartrate of antimony, a grain; sulphate of magnesia, an ounce; tincture of cantharides, a drachm; syrup of tolu, three drachms; water, five ounces and a half: mix. Two tablespoonfuls to be taken every two hours.

21st. Decidedly better; less pain in the head; no pain in the loins; still feels a little stupid; pupils dilated; pulse 86. The bowels have been freely evacuated during the night; has passed, since yesterday, ten ounces of urine.

22nd. Feels no better; urine less in quantity than yesterday, and high coloured. To continue the mixture with the antimony, and to drink freely of the solution of cream of tartar, to which a small quantity of gin was added.

23rd. Still better; no pain in loins; urine gradually increasing in quantity; the pain in the head has nearly left him. Has taken to-day, for the first time, solid food (a bit of toast), since he was attacked. He gradually recovered; and is now (1849) quite well.

Case II. Mr. W. H., aged forty, a farmer, of rather full habit, but very temperate, consulted Mr. R. Cooke, of Gainsborough, having walked a distance of five miles to see him. He complained of being "generally unwell," but could not say exactly what was the matter with him; his bowels were confined; had not passed any urine on the previous day, or during the night. The pulse was slow and full. The catheter drew off two teaspoonsfuls of urine. Twenty ounces of blood were taken. Calomel, saline aperients, diuretics, and a stimulating embrocation to the loins.

May 5th. Bowels freely opened; pulse the same as yesterday; has passed a small quantity of urine.

7th. Better in every respect.

He gradually recovered under the judicious treatment of Mr. Cooke, but never appeared to secrete a natural quantity of urine until he had remained some time at Buxton, making frequent use of warm baths. He never had any pain in his loins; in truth, so little did he and his friends think of his malady, that they quite laughed at the fears expressed by his very experienced surgeon. I look on this case, however, as we shall see presently, as one of partial non-secretion of urine only.

Case III. In 1837, Mrs. D., of Newland-street, Kensington, was attacked with pain in the hip and loins, quick pulse, and scanty high-coloured urine. She gradually became worse. Six months afterwards, *October* 1*st*, 1837, I again saw her; the urine was now fœtid, of a dark colour, often containing long strings of blood. She complained of great pain in the loins; she got rest neither night nor day. These symptoms continued until five or six days before her death; her headach then increased; the urine ceased to be secreted; none passed, and none was detected in the bladder on the introduction of the catheter. She now became comatose, in which state she remained two days: and died on the 14th of October.

Autopsy. Twelve hours after death, I assisted Mr. R. I. Pollock, of Kensington, in making a post-mortem examination of the body. Both kidneys, especially the right, were altogether disorganized.

Case IV. Mrs. C. I saw this case with Dr. Peacock, of Gainsborough. After she had laboured for six months under symptoms of Bright's disease of the kidney, the urine ceased to be secreted, and she became comatose, and died in two days afterwards.

Case V. Is the well-known one recorded by the late Sir H. Halford, and which we quoted at p. 580. Sir Henry Halford at once said, that if the kidneys could not be made to act, the patient would soon become comatose,

and would probably die in the following night ; and so it proved ; the kidneys could not be made to perform their proper office, and in thirty hours, he died in a state of stupefaction.

Case vi. Dr. Elliotson. A man had taken, by mistake, a quantity of corrosive sublimate ; "proper means had been used, and no harm was thought likely to occur ; but after a certain time the urine became suppressed. I think the individual had hemiplegia ; but I recollect perfectly that he became drowsy, and the drowsiness increased, till at length he became decidedly apoplectic, and died. One might have imagined, in such a case, that the urine would have been re-secreted into the ventricles of the brain ; or that if no urine were secreted, that an excessive quantity of urea would have been found within the brain. Nothing of the kind, however, was discovered in this case. There was not only no urine in the head, but no excess of fluid either in or upon the brain. That was a result for which we were not prepared." [1]

Suppression of Urine is not very uncommon in poisoning with bichloride of mercury. We know, that in very large doses it acts as a caustic poison, from its affinity for albumen, fibrin, and other constituents of the tissues. Dr. Christison admits of two varieties of poisoning by it, in one of which, the sole or leading symptoms are, violent irritation of the alimentary canal. He says, "the pain soon extends from the stomach over the whole abdomen, which becomes acutely sensible to the slightest impression ; violent purging, often of blood ; inexpressible anxiety ; flushed countenance ; restlessness ; pulse quick, small, and contracted ; cold sweats, convulsive movements of the muscles of the face and extremities ; sometimes diminished sensibility of one of the limbs, or of the whole body, or even paraplegia—*urine frequently suppressed.*" Two cases of poisoning by the external application of corrosive sublimate (in one of which the post-mortem appearances are given), are related by Mr. Ward. A youth, aged nineteen, rubbed in one ounce. There was constant vomiting, with *complete Suppression of Urine*, and frequent bloody stools. On the fifth day he died. The stomach was found much inflamed, and partially ulcerated ; the small intestines were also greatly inflamed, and the lower portion of the colon and rectum were in a state of mortification. The *bladder was contracted and without urine.* Cases of poisoning by the bichloride of mercury, in which there appears to have been complete Suppression of Urine, confirm what Dr. Watson [2] has stated with regard to peritonitis. Dr. Abercromby says, "*Inflammation of that part of the peritonæum which lies in the immediate vicinity of the kidneys, may cause Suppression of Urine.*"

General Remarks. The case of J. L. (Case i) suggests many considerations of practical importance ; and I believe this to be the only case that has been published, in which recovery has taken place after so long a total suppression of this fluid ;[3] for the difference between a *total suppression of urine, and the secretion of the smallest possible quantity*, is very great : in the one, there is a reasonable prospect of recovery ; in the other, the kidneys must be made to act, or death will inevitably take place. Dr. Mason Good designates this disease *paruria inops ;* Dr. Elliotson, in his lectures, speaks of it under the title of *ischuria ;* and Dr. Willis has well described it by the name of *anuria*, or *anuria apyretica.* There is so little of pain, discomfort, or uneasiness, felt by the patient, that some hours frequently elapse before the patient becomes aware that he has been attacked with a serious disorder ; and in a disease like this, which runs its course to a fatal termination in a few hours,

[1] Principles and Practice of Medicine, by J. Elliotson, M.D., p. 119.

[2] Principles and Practice of Physic, third edition, vol. ii, p. 357.

[3] Vide Dr. W. S. Oke's paper, London Journal of Medicine, p. 580. Dr. J. C. Hall indicates his scepticism in a foot note, but assigns no reasons.

how important is it that its earliest approach should be made known! Dr. Bright states, that in granular degeneration of the kidneys, "total suppression of urine but seldom occurs."

Suppression of urine depends on a variety of causes, and may be either *entire* or *partial*. Three kinds are mentioned by Dr. Prout: 1, *Inflammatory;* 2, *Spasmodic;* 3, *Mechanical*. A singular case of suppression of urine, from a mechanical cause, is related in a letter from Sir B. C. Brodie, now before me. He says: "I had a patient with an enlarged prostate, which prevented him emptying the bladder. For some time he had not secreted more than half a pint daily; but the secretion was immediately trebled on the catheter being used two or three times daily."

Many years ago, I opened the body of a gentleman who had suppression of urine for some few days before death, and *died comatose*. There was a large abscess, which had passed backwards from the kidney, and burst into the loins; and we found a calculus of oxalate of lime, of the size of a walnut, occupying the whole of the pelvis of the kidney, and extending into the infundibulum. The other kidney was increased in size; and had, no doubt, for some time, performed double its usual duty.

In suppression of urine, from whatever cause arising, if no urine be separated from the blood, death, ushered in by coma, quickly takes place. Death is said to result from urea being detained in the system. If the kidneys, from whatever cause, cease to secrete urine, urea accumulates in the blood, is carried with it to every part of the body, and acts as a poison, but more especially upon the brain. There are certain exceptions to the general rule, that suppression speedily proves fatal. Cholera patients will sometimes remain days without secreting a drop of urine, and yet recover. In such cases, I have no doubt that the urea is drained from the blood by the continued and enormous evacuations from the stomach and bowels.[1]

We have on record some truly singular stories of persons remaining for days—and even for weeks—without secreting a drop of urine, and who yet have continued in a good state of health. Some of these narratives are evidently altogether unworthy of credit; others are sufficiently well authenticated to demand at our hands a careful examination.

The two most common emunctories which supply the place of the kidneys, appear to be the bowels and the skin. We have had an example of the effect of large evacuations from the stomach and bowels in cases of malignant cholera; for, with total suppression of urine, there is no coma. In the case of Dr. Parr there was no vicarious evacuation, except a profuse sweat for a day or two. In this case there could not have been any imposture; the patient was in a hospital, and constantly watched. No mention is made of the state of the evacuations from the bowels. In Dr. Richardson's patient, there was an habitual diarrhœa. M. Andral infers that the blood contains, in variable proportions, the elements of all the secretions; that, under ordinary circumstances, these elements are separated from the circulation only by those organs whose special structure is adapted to bring about such separation; but that, under particular states, these elements may be separated from the circulation by other channels than those regularly intended for the purpose,—not, indeed, in the condition of perfect secretions, but in a more simple form, containing, however, the essential elements of these secretions. The conclusion to which the majority of the most celebrated chemists have arrived, is, that the urea excreted by the kidneys, is derived, for the most part, from the transformation or decay of the textures of the body; most of their carbonaceous matter being extracted by the affinity of the oxygen of the blood, and carried off by the lungs in the form of carbonic acid gas. The

[1] Urea is sparingly, if at all, found in the choleraic paroxysm. This vital metamorphosis does not seem to go on till reaction commence. It is difficult to find a trace of urea in cholera stools. Editor London Journal of Medicine.

effect of the non-secretion of urine on the system, has been proved also by the experiments of Dumas and Prevost on animals in which they had extirpated the kidneys. On the third day after the operation, the poor creatures were seized with vomiting, and a profuse diarrhœa of a brown liquid, which, Dr. Day informs us, the recent researches of Bernard and Barreswil have proved to contain a considerable quantity of ammoniacal salt, resulting from this elimination of urea from their surface. Fever, with heat, varying sometimes as high as 110°, and sometimes as low as 92°, accompanied this purging; pulse very small and frequent; respiration oppressed. Death took place from the fifth to the ninth day. The post-mortem appearances were, effusion of serum on the brain, copious mucus in the bronchi, and bilious fluid and fæces in the intestines. The urinary bladder was much contracted, and the liver appeared inflamed. The blood was more watery than natural, and was found to contain urea. From five ounces of blood taken from a dog, twenty grains of urea were obtained; and two ounces of blood, taken, under similar circumstances, from a cat, yielded ten grains.

In *injuries of the spine in the vicinity of the kidneys*, or *tubercular disease of the chord*, we have always more or less retention of urine, with considerable febrile excitement: and very frequently a marked diminution of the quantity secreted. In some patients, the urine first secreted, although acid and free from mucus, has a very offensive smell. In other cases, it deposits a yellow amorphous sediment. The most common change is a peculiar ammoniacal odour, and the deposition of a large quantity of adhesive mucus, the urine being alkaline. After some time, phosphate of lime, secreted by the inner coat of the bladder, becomes blended with the mucus, which is also streaked with blood. This state of things may arise three or four days after the accident, or they may not be noticed for a week. In one case I remember, they did not make their appearance until nine or ten days after the accident. I am not aware that they occur after injury to any particular portion of the spine; in fatal cases, they remain to the last; in others, which recover, they sometimes go on for three or four weeks. Another peculiarity, to which my attention was directed by Sir B. C. Brodie, consists in the variation which takes place in the state of the urine: to-day it is alkaline, depositing adhesive matters; to-morrow it is clear and acid; and the day after, perhaps, it is again alkaline. Suppose a man falls from a ladder and injures his spine: very little disturbance following, the accident may be altogether disregarded. What is too often the result? In a day or two the patient is attacked with paraplegia; then we may have gangrene of the nates, and retention of urine; in a week, or perhaps longer, the secretion of urine becomes day by day diminished, and is, in the end, altogether suppressed; then we have coma, speedily succeeded by death. I mention these cases to direct attention to the very great importance of making a careful examination of cases of this kind. Dr. Williams thinks it very probable, that severe mechanical injuries or shocks operate by weakening the vital powers, by which the blood is perpetually purged from its own impure products. That this is, in part at least, their mode of action, appears clear, from their effect in suppressing or impairing the natural excretions; and, in such cases, urea has now and then been detected in the blood.

Treatment. 1st. *Cases of partial suppression of urine.* Such cases are very far from uncommon. A gentleman exposes himself to a cold atmosphere: for example, remains loitering about in his garden, on a cold April day; in the evening he complains of having "taken cold", and creeps to the fire; he has an attack of shivering; he retires to bed; his skin becomes hot and dry; the urine is small in quantity, and of a dark colour. This attack often continues for some days; after which, under appropriate treatment, the urine gradually becomes secreted in larger quantities, and the patient recovers his usual health, the improvement commencing with the increased se-

cretion of urine. This I have observed so often, that no doubt remains on my mind as to its correctness; and its bearing on the treatment of disease is highly important.

Dr. Golding Bird shows that the kidneys remove from the blood all excess of water, together with the metamorphosed products of effete tissues, or mal-assimilated food; that these organs are, in reality, the "depurators" of the system, and the teachers of the numberless chemical changes which are constantly taking place both in the healthy and diseased animal fabrics. He has come to the conclusion, that from 600 to 700 grains of solid materials are daily separated by the kidneys of a person in a state of health. He has also constructed a very important table, by which, in a moment, the relation between the specific gravity of the urine, and the amount of solids contained in an ounce of it, may be ascertained. Dr. Golding Bird also draws attention to the fact, so well known to all whose eyes have wandered over the Hippocratic writings, that there is "an obvious relation between the termination of some phases of disease and a crisis by urine." He has been enabled, by the powers of modern science, to prove that what was said by the old physicians, with regard to a crisis by the urine, is founded in fact. He gives the results of several cases of intermittent fever, which were under his care in Guy's Hospital, and remarks: "If I can prove that, concomitantly with an enormous increase in the excretions of the kidneys, sudden improvement occurs in a patient,—which change for the better does not take place until this great change is observed,—I think it will be conceded that I shall produce sufficient evidence to show that the observations of our predecessors were correct, and that something like a critical excretion from the kidneys does take place, —at least in the diseases which have been sufficiently carefully studied in this point of view."—Lect. iii.

2nd. *Cases in which there is a total suppression of urine.* It remains only to say, in conclusion, a word or two on the treatment of those singular cases to which Sir H. Halford first of all directed our attention,—in which, independent of acute disease—independent of any derangement he could discover in the structure of these organs—their secreting office was completely suspended. This constitutes the disease which Dr. Willis has named "anuria", said by him to terminate in coma in four or five days, and in death in a few days more. I venture to say that a fatal result, according to my experience, occurs much more quickly. In three out of the five fatal cases which came under the observation of Sir H. Halford, a very strong urinous smell was observed in the perspiration for twenty-four hours before death. The patients all died with "symptoms of oppression on the brain".

Looking at those cases of cholera which have recovered, in which suppression of urine has continued some time, I am inclined (and the benefit was evident in the case of J. L.) to advise, at the first, that a full dose of calomel and colocynth, with a drop of croton oil, should be made into a pill and given to the patient; this to be followed by an aperient draught of infusion of senna, sulphate of magnesia, and cream of tartar. A large stimulating glyster should also be exhibited, so that the bowels may be largely purged three or four times; cupping over the loins; bleeding, if the state of the pulse admit of it; warm baths; a large blister to the loins; and full doses of powdered cantharides,—a remedy which was very successful in the hands of Sir A. Cooper, and which, in one case of total deprivation of urine, in which I was consulted, was most certainly followed by a re-secretion of urine, after all hope of success had been abandoned, and the recovery of the patient regarded as all but impossible.

Treatment, by powerful diuretics, may theoretically appear incorrect; but, so far as we know at present, it is one that has been found, practically, the most successful. [Abridged from *Lancet*.]

The subject treated of by Dr. John Charles Hall, in the papers of

which we have given an abridgment, is replete with interest: too often do practitioners overlook in their treatment the scanty secretion of urine—and we would particularly call attention to what the author says regarding cases in which there is only partial suppression.

The phenomena of partial and complete suppression of urine involve some of the most interesting inquiries connected with the great subject of toxæmia; and while they lead us to appreciate the extreme value of the modern researches of Drs. Bence Jones, Golding Bird, Garrod, Parkes, and others, they induce us to peruse with increased respect the dust-covered volumes of the ancient fathers of medicine. While we would deprecate a return to exclusive humoralism, we hope to see the study of the blood continue to engage the attention of physicians as much as, and even more than at present. From the chemical examination of the blood, and the chemical and microscopical scrutiny of diseased growths, and of the excretions in health and disease, brilliant therapeutic discoveries must arise; nay, are already appearing in some of the practical improvements resulting from the labours of the above-named, and other physicians.

It is well to remember, that in the treatment of any suppressed excretion, especially when the suppression is complete, we must—even before we attempt to restore the function—at once, and with the utmost urgency, strive, by some decisive measure, to avert impending, and too often inevitable death, from blood-poisoning. Minutes may be valuable. By the skilful use of means—perhaps by the lancet, an emetic, or a hydragogue cathartic—we may gain sufficient time, and pave the way for the use of other remedies which also require to be directed against the prime cause of the symptoms. In a case of acute hepatitis, we have seen coma and convulsions suddenly supervene: the patient was, when hope had almost fled, rescued from the clutch of death by rapidly inducing purging. A profuse sweat, a violent fit of vomiting, or of diarrhœa, are often Nature's methods of getting rid of a morbid poison, of arresting toxæmic phenomena, and of thus commencing a cure. From these facts, physicians have derived useful lessons. Dr. John C. Hall draws a fair induction from the excessive purging in cholera, when he attributes to it the absence of coma; though it must be remembered, that *cholera stools do not contain urea*. We now know, that during the choleraic paroxysm, urea is very sparingly formed in the blood, if formed at all: it is not till reaction sets in, that this vital metamorphosis recommences: then, but not till then, have we an excess of urea in the blood, then also we have the sign of this, viz., albumen in the urine. The "albuminose" of cholera stools, when the bio-chemical changes are re-established, becomes metamorphosed, within the blood, into the normal excrements of that fluid. The researches of Drs. Parkes, Garrod, and others, seem to justify such conclusions.

We cannot allow the unexplained recommendation of a stimulating diuretic, such as cantharides, to pass unnoticed. We believe that the circumstances never occur, in which this medicine ought to be given in complete suppression: and even when the affection is partial, we would only advise it in the anæmic and atonic: in such patients, when combined with iron, we have seen benefit result from its use. In them, the secretion is defective from want of blood, and nervous energy; but in nine cases out of ten, of total or partial suppression, there is no anæmia, and the patients are suffering from congested kidney, with or without granular or other degeneration.

DR. J. F. BEHREND'S MEMOIR ON DROPSY AFTER SCARLATINA.

Dr. F. J. Behrend, of Erlangen, has published very valuable Observations on Dropsy after Scarlatina in the *Journal für Kinderkrankheiten* for March and April 1849, of which we subjoin a pretty full abstract. He describes—1. Dropsy dependent of congestion and inflammation of the kidneys *(Hydrops nephriticus)*; and, 2. Dropsy dependent on debility or impoverished state of the blood *(Hydrops anæmicus)*.

I. Dropsy from Congestion and Inflammation of the Kidneys. The Dropsy may appear as early as the fifth or sixth day after the appearance of the eruption, or as late as the fifth or sixth week. The form of Dropsy under consideration is preceded by certain premonitory symptoms, which should excite suspicion. Sometimes desquamation has scarcely commenced, when the redness of the skin has entirely disappeared. The child appears to have recovered; but a carefully observing medical attendant finds, from the somewhat accelerated pulse, the failing or, at least, irregular appetite, and the disturbed, though prolonged sleep, that the patient still has some of the *materies morbi* remaining in him. The child is peevish; the skin is cold and pale; the pulse becomes quicker; and œdema soon appears. Sometimes it is ushered in more violently: as in a case where the child was seized, on the tenth day after the appearance of the eruption, with intense fever, and was delirious throughout the night. On the next day, œdema appeared, which increased as the fever decreased. In most cases the œdema appears slowly and gradually, first on the face, then on the hands and feet. The attack is almost always accompanied by loss of appetite, great thirst, constipation, and retention of urine, at the same time that there may be urgent desire to pass it. The extent of the œdema is very various in different cases, and varies even in the same case. Sometimes it is confined to the eyelids, frontal region, and cheeks; sometimes it extends over the whole body, and has occasionally ascites conjoined with it, or even, in a few cases, Dropsy of the pericardium. In many cases the œdema alternately increases and diminishes.

Case i. A little girl, seven years old, was attacked, on the fourteenth day after the attack of scarlet fever, with œdema of the face and hands, soon extending over the whole body. On the third day, after appropriate treatment, there was only a slight swelling of the wrists and knuckles. But, on the next day, the œdema was found to be again extending over the legs, organs of generation, and lower parts of the abdomen. No cause for this could easily be assigned, except that on that night there had been a sudden change of temperature, which appeared to have had a considerable influence on the temperature of the interior of the house.

The symptoms which accompany the Dropsy are not always in relation with the extent of the œdema. They are frequently modified by the existence of effusion into the serous cavities. It is evident, that the symptoms will be different, and of greater intensity, when the general Dropsy is complicated with Dropsy of the pericardium. Another group of symptoms will be produced by the supervention of ascites or hydrothorax. These complications, which are not unfrequent, influence not only the phenomena of the disease, but also its result. If there be no effusion in the serous cavities, the phenomena are usually simple and mild. A slight fever continues for two or three days; after which there is a copious flow of urine, and the œdema rapidly disappears. Sometimes the œdema, when it is very extensive, continues from five to eight days, attended with pain in the back and loins, and may even last to the tenth or eleventh day, before the kidneys have regained their function, and the Dropsy begins to subside. The worst cases are those in which there is effusion into the serous cavities. There is also another complication, which Dr. Behrend has observed in two cases—œdema of the lungs.

Case ii. The patient was a girl, aged nine years. The eruption was vivid, and continued for three days; the desquamation commenced on the morning of the fourth or fifth day. At 3 p.m. of this day I again saw the child, and found it lying quiet and without any complaint. As it had been previously restless, I was surprised at the contrast, and feared that some untoward symptoms might supervene. I therefore again visited the child at 9 p.m., and found fever—that is to say, a small, unusually quick pulse, but nothing else remarkable. On the morning of the next day, I learnt that the patient had passed a very restless night, had slept little or none, had desired to drink much and frequently, and had often had a desire to pass urine, but had only passed it in small quantity, and of a very dark colour. On examining the

child, I now perceived considerable œdema, extending over the whole face. This continued, in spite of the remedies employed, till the next day, when it began to disappear, and was almost entirely removed on about the tenth day. The child, however, had a feverish attack every evening; the appetite was not regained; but there was constant thirst, although not so violent as before. The bowels were moderately open, but the amount of urine passed was still scanty, and not at all in proportion to the quantity of drink which was taken. On testing the urine, a pretty considerable quantity of albumen was found in it; and a microscopic examination showed a multitude of fragments of epithelium, with blood-corpuscles and pus-globules. On the fourteenth day, there was a sudden increase of the fever: the child complained of pain in the back and loins, and was very restless. She slept but little, and talked in her sleep; she lay with her eyes half open, ground her teeth, and often rose up. On the morning of the fifteenth day, there was considerable œdema, extending over the whole of the lower limbs, and the hands and face. Proper remedies were immediately employed, but without much success. On the seventeenth day, the Dropsy was general, and considerable; the countenance could scarcely be recognized, from œdematous swelling, and a certain expression of internal pain; the walls of the abdomen were much infiltrated, and it was difficult to discern whether ascites existed. The urine was scanty, dark-coloured, highly albuminous, and, on standing, deposited a muco-purulent reddish sediment. The child complained only of pain in the back, and severe pain in the loins. It could not remain long in the horizontal position, being threatened with suffocation; it gasped for breath, and a short, dry, hoarse cough immediately came on. It had to be quickly raised, and well supported by pillows. The remedies which were employed to restore the function of the kidneys were of no avail; the breathing became shorter, and more difficult, the universal infiltration more intense, and the child died, making violent attempts at breathing, on the twenty-first day of the illness. The autopsy showed, besides a granular condition of the kidneys, considerable œdema of both lungs, but especially of the right.

Case III. In this case, that of a boy seven years old, the symptoms and result were very similar to the last. The first traces of œdema were evident on the fifteenth day from the appearance of the eruption; there was no variation in the Dropsy, as in the last case, but, in spite of all remedies, it gradually increased, till it became universal. Impeded respiration supervened; the breath was drawn constantly, and with great pain; it then became more difficult and short—and at last ceased. A post-mortem examination was not permitted; but the existence of œdema of the lungs was placed beyond a doubt, by the auscultatory signs which existed during life.

Effusions into the serous cavities after Scarlet Fever, occur, according to my observations, in the following order of frequency:—1. *Ascites.* 2. *Hydrops Pericardii.* 3. *Hydrothorax.* 4. *Hydrocephalus.* Pulmonary and cerebral œdema are, in some measure, consequences of the impediment to the circulation, resulting from the general œdema; the former do not occur without the latter. It is to be remarked, that there seems to be a certain inverse ratio between the effusions into serous cavities, and those into the subcutaneous cellular tissue. The more extensive the œdema, the less the effusion into the serous cavities, and *vice versâ.* Ascites, however, seems to be an exception. Sometimes this antagonism is very remarkable.

Case IV. Elise H., aged seven years, a lively healthy child, a brunette, not of a scrofulous constitution, had Scarlatina; during which she was watched with the greatest care. Towards the third week after the appearance of the eruption, while apparently going on favourably, she was seized with a sharp pain in the right side, between the third and fifth ribs,—in short, with all the symptoms of pleurisy. A few leeches were applied, and followed by a blister, removed from place to place, every six hours, so as only to produce redness of the skin. No other medicines than demulcents were given inter-

nally. Up to the third day, the pain in the chest continued to increase, and leeches were again applied. Symptoms of oppression, and attacks of dyspnœa, and a dry teazing cough supervened; these distressing symptoms had increased on the next day. There was little doubt that the pleurisy was complicated with watery effusion. A colleague, whom I had called in consultation, considered that benefit might be obtained by stimulating the kidneys; we therefore ordered digitalis, with acetate of potash; and weak infusion of elder flowers as a drink. Towards the evening, when the child had scarcely taken a spoonful of the medicine, there occurred so violent an attack of orthopnœa, with palpitation, that an immediate fatal result was apprehended. This continued till late at night, when the child fell into a sound sleep, in which it continued till morning. I was then surprised to find it lying quiet, without any difficulty of breathing; but the face, feet, and hands, shewed extensive œdema. This quickly increased; and in two days had become general. It was accompanied by constipation, and scanty and albuminous urine. The breathing was free, and the pulse small and rather slow. Acetate of potash was administered in larger doses, while the digitalis was somewhat diminished. Infusion of senna, with tartrate of soda, was also given. On the fifth day, from the commencement of the œdema, there was copious diuresis, and the œdema seemed rapidly disappearing. The urine contained still a considerable quantity of albumen. In a few days, the Dropsy had almost entirely disappeared; and the parts which had been affected with it; viz., the arms, legs, and abdomen, were wrapped in flannel. This improvement, however, was of no long duration. On the evening of the same day on which we had begun to give tonics, the child was seized with a dry cough, and with sharp pain in both sides of the chest. These increased during the night; and in the morning, the distress, oppression, and difficulty of breathing, were as severe as ever. Leeches and blisters were employed; but the distressing symptoms continued to increase from hour to hour. Orthopnœa, palpitation, and slight œdema of the face set in, and the child died on the next day. At the autopsy, both pleural cavities, especially the right, were found filled with a large quantity of serum. The lungs were apparently healthy. There was no effusion into the pericardium; the heart was healthy. The kidneys were hard and firm, and internally were in a state of granular degeneration There was then in this case, first, pleurisy with effusion, probably only on the right side; this gave place to general anasarca; and as this disappeared, effusion into both pleuræ occurred, and caused death.

The question as to the relation of albuminuria to the dropsical effusions, bears on the existence of Bright's disease. It is now correctly doubted by many, whether the granular change in the kidney, which has long been considered as the cause, or the proper origin of albuminuria, be really the commencement of Bright's disease. The granular condition is rather to be looked on as a sequel, or rather as a consequence of the same congestion which produces the albuminuria.

The urine, in cases of Dropsy after Scarlatina, is scanty; at first clear, then darker; becomes turbid on standing, and deposits a whitish sediment. It has an acid reaction, is usually of low specific gravity, and deposits masses in the form of flocks on the application of heat. When the Dropsy is more extensive, the urine becomes of a dark dirty brown colour, with a reddish brown sediment; heat throws down a large quantity of albumen. Under the microscope, the sediment presents crystals of urate of ammonia, blood-corpuscles, pus-globules and mucus-globules, and epithelium particles. The kidneys present very little change in the slighter cases, where there has been little œdema, and when the patient has died of affection of the brain, or some other accidental complication. They are only firm, and full; and on section, the cortical substance is seen to be very red, and apparently in a state of intense capillary congestion. But in those cases in which the Dropsy has been of greater extent and duration, and where death has been produced by, or has

soon followed it, the kidneys exhibit that change, which Dr. Bright has so acutely and accurately described in the disease which bears his name. The capsule can be torn off more easily than is natural, and the surface is pale and spotted. On section, the cortical substance is distinguished in a most remarkable manner, by its pale clear straw colour, from the extremely dark-coloured tubular substance. The contrast is sharp and distinct; the tubular substance is highly injected; so, also, are even the pelvis and infundibula. Under the microscope, the granular condition of the cortical substance, which can be felt with the finger on the surface of the section, is found to be produced by a blocking up, or obliteration, of the tubuli and interspaces with pus-globules, and mucus-globules; and by these exudation corpuscles, the capillary vessels are in part compressed, in part entirely obliterated. The latest researches of G. Johnson, Busk, Toynbee, and Simon (*Med. Chir. Trans.*, vol. xxix and xxx), have shewn, that this alone explains the apparent anæmic state, or the clear pale yellow colour, of the cortical substance.

In explaining the general phenomena of the Dropsy, it is to be remembered, that the skin and kidneys are vicarious in their function. The nature of the scarlatinal poison we are not acquainted with; we cannot isolate it by physical or chemical means. We know, however, that it exists; and farther, that its tendency is chiefly to the skin, and next to the kidneys. It is generally considered a highly favourable circumstance if the eruption be well developed in cases of scarlatina; the danger is not indeed removed, but considerably diminished. Whether the desquamation be necessary to the elimination of the poison, is not discovered. It appears not to be so; and the treatment adopted by Scheeman, in Hanover, and confirmed by Mauthner, of rubbing with fat, so that desquamation is prevented, appears to indicate that it is not necessary. It appears, then, that desquamation is to be considered as a sequel of the inflammation of the skin. If desquamation be prolonged, the excreting function of the skin must be impaired, and the kidneys then assume increased activity: hence, the scarlatinal poison is determined for elimination as much to the kidneys, as to the skin. The intensity of this determination evidently depends on the intensity of the scarlatinal poison existing within the body, which seems to vary greatly in different epidemics, and in different individuals. The greater the poisoning is, the greater and longer will be the process of elimination in favourable cases. A very lively cutaneous eruption and a certain degree of determination to the kidneys may be sufficient; but one of the following events may happen: 1. The attempt at elimination by the kidneys may be in greater proportion than that by the skin; 2. The elimination of the scarlatinal poison may not end at once, but may cause a fresh irritation, which will not produce efflorescence, but, as the skin has been impaired in its functions, will lead to watery exudation into the subcutaneous cellular tissue. Elimination by the kidneys can never tend to so favourable a result as that by the skin; for, in the former organs, congestion is produced, and, as a consequence of this, diminished excretion. The vessels of the cortical substance become obstructed; the tubular substance throws off a part of the exudation in the form of albumen; while another part is deposited in the form of granulations, compressing and obliterating the vessels. The impediment, greater or less, to the excretion of urine, must lead to effusions into the serous cavities or cellular tissue. I am inclined to think that the Dropsy is partly a direct result of the impediment to the eliminative process of the skin, and of the efforts of Nature to restore this, and partly a consequence of the impediment to the excretion of urine by the kidneys. To the latter cause, the effusions into the serous cavities seem referable; while the Dropsy of the cellular tissue seems to be a sequel of the renewed attempt at elimination by the skin.

There must be some co-operating agency—a specific cause—which may directly lead to accumulation in the kidneys and to albuminous exudation. For were it otherwise, there would always be congestion and exudation of

albumen in cases where there is increased tendency to the kidneys, in consequence of impeded cutaneous function. This specific matter can only be the scarlatinal poison, which endeavours to get eliminated by the kidneys, as well as by the skin. We may, therefore, place the eliminative function of the skin, as manifested by eruption and œdema, on the same line with congestion of the kidneys. I am convinced that the prevention of the excretion of urea from the blood is the chief cause of the dropsical effusions. Albuminuria is, indeed, a dangerous symptom; but it is no evidence of the intractability of the disease, or of imminent death. Recovery is certainly tedious; but there is not such a predominant disposition to disorganization of the kidneys, as in the so-called Bright's disease of old drunkards. The more violent the affection of the kidneys is, the greater is the danger, as death may occur from sudden effusions into the serous cavities. In cases where the patients have died of Dropsy of the pericardium, or of hydrothorax, or of hydrocephalus, after scarlatina, the kidneys are found highly congested, especially in the tubular substance. Dropsy of the cellular texture seems to diminish the danger of effusion into the serous cavities; but death may be caused by œdema of the lungs.

Treatment. Dr. Behrend here observes, that the first thing to be done is to diminish the congestion of the kidneys, so as to prevent the exudation of plastic matter, and to restore the diuresis. For this purpose, the best means are repeated applications of a sufficient number of leeches—from six to ten—to the lumbar regions, or repeated cuppings: the former seem the best remedy. The second indication is to restrict the diet, and to administer mild diuretic salts, as the acetates of potash and soda, which act also on the intestinal canal. Infusion of elder-flowers is useful as a drink, for promoting diuresis. The body should be kept warm by being wrapped in flannel, impregnated with the vapour of sugar: this is prepared by throwing pounded white sugar on glowing coals, and holding the flannel over it. The limbs may also be enveloped in raw wool. I have lately tried the effect of sponging the skin with turpentine, and then covering it with flannel; but cannot speak with certainty as to the efficacy of this treatment. If the dark colour of the urine return after it has been removed by means of local depletion, this must be repeated, without any regard to the apparent weakness of the child. This state of the urine is indicative of a highly congested state of the kidneys. If the attack be less acute—if there be œdema, and the urine be albuminous, but clear and in sufficient quantity, spirits of nitric æther may be used, in addition to the diuretic salts. A restricted diet is not so necessary, as that the child should be kept in bed and in a warm atmosphere, so that the skin may be kept in a state of functional activity. Friction with oil of turpentine, warm baths, and mild purgatives, are indicated: sanguineous depletion is not proper. The child must be kept very warm for a long time: it should be daily rubbed with flannel for a month; and if it continue pale and weakly, iron should be administered; and the patient should have the benefit of country air. In Dropsy of the pericardium and pleura, and in hydrocephalus, there is so great danger, that these affections will have to be treated without reference to the original cause of the disease. There is but little hope of recovery, unless Nature takes some extraordinary course.

ii. Dropsy from Debility or Anæmia (*Hydrops anœmicus*). This is the result of debility or anæmia, and resembles the Dropsy which arises from that cause, when scarlatina has not occurred. When a weakly, delicate, anæmic child is seized with scarlatina during an epidemic, the eruption is generally slight and very transient. On the third or fourth day, or later, œdema of the joints sets in. The pulse is usually small and somewhat accelerated, but the fever is very inconsiderable or entirely absent, the tongue and lips are pale, and the countenance somewhat sunken. The urine is pale; and contains no albumen, or so little, as not to be noticed. Drs. Philip of Berlin, and Kennedy of Dublin, have recorded cases of this kind. This form of

Dropsy depends less on congestion of the kidneys, than on the deficiency of fibrin in the blood; which, when there is an effort to eliminate the scarlatinal poison by the skin and kidneys, cannot effect this process, but gives rise to a watery exudation. The diagnosis is easy, if the urine be examined. The absence or small quantity of albumen, and the non-existence of blood or of exudation-corpuscles, give full information. The urine has not generally an acid reaction: it often contains an abundance of phosphates. The treatment should consist of the tartrate, carbonate, or hydrochlorate of iron, which may be combined with bitters.

Conclusions. 1. Two forms of Dropsy occur after Scarlet Fever, the *nephritic* and the *anæmic*. 2. These distinctions only point out the original evil, which is the cause of the Dropsy. 3. In *hydrops nephriticus*, the main affection is a highly congested state of the kidneys, even proceeding to inflammation. 4. This congestion of the kidneys is just as much a specific effect of the scarlatinal poison, as the cutaneous congestion and eruption. 5. As a consequence of the congestion, there is exudation into the kidneys; and, from rupture of capillary vessels, some effusion of blood, which tinges the urine of a dark chocolate-colour. 6. The presence of albumen in the urine is partly the result of exudation, partly of the mixture of blood. 7. The small vessels and tubuli of the kidney are partly compressed, partly obliterated, by the exudation, so as to give a granular appearance: the capillary vessels of the cortical substance are partly empty, partly filled with exudation-corpuscles, without red blood, which produces the pale yellow colour of this substance. 8. The tubular substance undertakes the whole function of the kidney. A more powerful flow of blood and urine to this part produces within the tubes a removal and reproduction of epithelium (analogous to the eruption and desquamation in the skin), and finally a discharge of albumen with the urine. 9. The impediment to the function of the cortical substance of the kidneys—the modification to such an extent of the function of the tubuli—prevents the full elimination of urea from the blood. 10. Being retained in the blood, the urea mixes with it; and, in conjunction with the scarlatinal poison, produces nervous symptoms of a narcotic character: delirium, coma, sopor, etc. 11. To this mixture of urea with the blood, as well as to the endeavour to eliminate the scarlatinal poison by the skin, is the watery effusion to be ascribed: the effusion into the serous cavities is entirely a result of the presence of urea in the blood. 12. The danger attending the Dropsy depends on its situation, and on the amount of organic activity which is present. 13. Effusions into the serous cavities are especially dangerous, while cutaneous Dropsy is of less moment; and, of the effusions into serous cavities, that into the peritoneal cavity is less dangerous than those into the cerebral and pericardial cavities. 14. The greater the activity of the organism, the less is the danger; for this shows that the blood has not retained any considerable amount of urea. 15. So long as the urine gives evidence of the presence of blood, with epithelium, besides albumen, and has an acid reaction, the danger is less than when it is clear, phosphatic, and at the same time highly albuminous, as this indicates an extensive and progressive degree of poisoning of the blood. 16. The indications of treatment, in cases where the urine contains blood and albumen, and is acid, are to diminish the congestion of the kidneys, and to promote the full elimination of urea. An antiphlogistic and saline treatment is here indicated. 17. As soon as the urine, while it contains albumen, becomes of a pale yellow colour, and ceases to have an acid reaction, the antiphlogistic and saline treatment is improper. It is then necessary to counteract the poisoning of the blood, and to increase its plasticity. Iron and tonic medicines are here indicated. 18. The same treatment is necessary, when a weakly, anæmic child has been seized with Dropsy soon after a slight attack of scarlatina. The urine here contains little or no albumen; and the plasticity of the blood is so low, that death will result, if it be not increased by the diligent use of tonics.

SUGAR FOUND IN THE BLOOD, TISSUE OF THE KIDNEY, ETC., BUT NOT IN THE SPLEEN AND PANCREAS, OF A DIABETIC PATIENT, WHO DIED SUDDENLY.

M. Bernard lately examined the body of a diabetic patient, under the care of M. Rayer, who died suddenly on the third day after admission into hospital. The urine, drawn off while the patient was yet warm, contained a large quantity of sugar. The liver, mis-shapen, and much larger than in the natural state, contained also a large proportion. The kidneys were also enlarged; the left kidney weighed 245 grammes (nearly 8 ounces), and the right, 235 grammes (7½ ounces). On washing the tissue of the kidneys, sugar was obtained, but in a much smaller quantity than from the liver. The pancreas and spleen were diminished in size, and contained none: nor was there any in the nervous centres. The blood contained large quantities of sugar, from whatever part it was taken. M. Bernard, in calling to mind a case, in which the serum of the blood, left to itself, became acid by the decomposition of sugar, remarks that this bears on a circumstance in the present autopsy. Sugar was found in the serosity which filled the pericardium; but this same alkaline serosity, when removed from the pericardium, became acid in consequence of the decomposition of the sugar. The intestinal and gastric juices, which seem remarkably fitted for the decomposition of sugar, contained none. M. Bernard has met with sugar in the semen of a goat, which had been artificially rendered diabetic. It is interesting to know that, in cases where the tissues and fluids of a diabetic patient can be examined after sudden death, sugar may be found in the blood, liver, and kidneys. The difference in the reaction of the fluids, hitherto referred to the cause which produces the diabetes, are seen to be dependent merely on the decomposition of the sugar. [*Gazette des Hôpitaux*, 10th July, 1849.]

CAMELINE—A NEW PROPHYLACTIC AGAINST SMALL-POX.

Dr. Agnielli, Director of the Committee of Vaccination at Algiers, has found a new virus, which, like the vaccine, is protective against small-pox. He proposes to call it "Cameline", since, according to the statement of the Arabs, it is the product of an accidental eruption on the female of the camel; it resembles that of the cow. We should rather imagine it to be *the same* virus transmitted through a different animal, and not a resemblance only; and, if there be anything accidental about it, it is the camel, and not the eruption which is so. However, Dr. Agnielli intends travelling with a caravan, in order to verify his conjectures. [*Medical Times*, July 21.]

HOOPING-COUGH CURED (?) BY COFFEE.

Various medicines have from time to time been brought forward as specifics in Hooping-Cough; and some of them we have tried. To quinine, salicine, arsenic, and oxide of silver, we have given a fair trial in a considerable number of cases: and the result of this experience is, our belief that all of them, except the last named, possess some power in checking the disease, when it has gone on for some time, and is marked by periodicity. When the hour of the recurrence of the fits comes to be accurately foretold, all of the above-named drugs given in full doses in anticipation of the attack, postpone, or entirely prevent it. In the early stages, or later, where there is some amount of bronchitis, the free use of stimulating embrocations, with occasional expectorants, and stomachics, and alteratives (such as a powder composed of cusparia, trisnitrate of bismuth, and rhubarb), are the means we trust to. When the cough assumes a distinctly periodic character, we recommend a trial of antiperiodic remedies and change of air, both of which measures, in many cases, prove of signal and speedy benefit.

From Pereira's summary of the therapeutic uses of coffee, it is not unlikely, however, to exercise some control in hooping-cough. "It has," says Pereira, "been employed as a febrifuge in intermittents; as a stomachic in some forms of dyspepsia; as an astringent in diarrhœa; and as a stimulant to the cerebro-spinal system in some nervous disorders." Floyer, Dr. Percival, and others, have used it in spasmodic asthma; and Laennec says, "I have seen several cases in which coffee was really useful." *Pereira*, vol. ii, ed. 1842, p. 1441.

The recommendation of coffee, in Hooping-Cough, seems decidedly to merit attention. Dr. Jules Guyot,[1] who advocates the use of the remedy, writes thus, in the *Union Medicale* for 24th April, 1849:—"*Café à l'eau*, hot, and well sugared, in suitable doses, taken four times, or oftener, daily, will cure, in from two to four days, the most obstinate cases. For a child of two years, the dose is a teaspoonful; for a child of four years, a dessert spoonful; and for an elder patient, a tablespoonful. To obtain a rapid and permanent cure, it is necessary to conjoin with the coffee treatment, a diet of fried and roast meat, taking care to mince it, if the child cannot masticate it sufficiently. The quantity of milk used, ought to be diminished: and farinaceous food, confectionaries, and fruits, must be entirely prohibited."

The alleged specific power of coffee in hooping-cough, was accidentally discovered by observing the following case:

A child, of four years old, under rigid dietetic treatment for measles, was seized with congestion of the lungs, against which energetic antiphlogistic treatment was put in force. When Dr. Guyot was called in, death seemed imminent from violent paroxysms of cough, which induced such alarming suffocation and syncope, as to cause the patient to appear to be actually dead. Some spoonfuls of strong beef-tea, with some spoonfuls of sweet and hot infusion of the lime-tree, were prescribed. The child passed the night without fainting. On the following day, the same infusions were continued, and in addition, there was given a little bit of grilled and finely minced mutton, with the view of restoring strength as rapidly as possible: but a severe fit of coughing came on, which terminating in vomiting, caused ejection of the food: recourse was again had to the beef-tea, which provoked a similar fit of coughing, and was ejected. In these circumstances, with death apparently impending, a tea-spoonful of coffee was given after each tea-spoonful of beef-tea. Not only was the beef-tea retained: but, to my great surprise, the cough likewise ceased. Two hours afterwards, the child took with relish a little bit of hashed cutlet, followed by a tea-spoonful of the coffee: the food was not ejected, digestion went on naturally, the night was passed in comfortable sleep, there was no more cough:—and in truth, the child was saved. On the following day, the treatment was continued, and there was a continuance of a like satisfactory state. On the third day, however, the relations omitted the coffee, when the cough returned, after the first meal, with all the characteristic violence of well-formed hooping-cough: and this state continued during the day. On the fourth day, when the coffee was resumed, the cough disappeared. During forty-seven days the coffee was persisted in, when the cure was distinctly complete. The little patient was the only daughter of M. Haquin, a master bootmaker of Argenteuil.

This case was furnishing subject of serious reflection, when Dr. Guyot met in a public conveyance M. Bouju, ex-notary of Franconville: he told him that he had been obliged to have double doors for his study, to keep out the terrible and incessant noise caused by his two children with hooping-cough. Dr. Guyot detailed the case above narrated: and he cured both his children in four days by means of coffee. He has since tried the remedy successfully in above sixty cases. The efficacy of coffee in hooping-cough seems to show that the seat of the disease is not in the bronchial tubes or larynx—nor in their

[1] Not M. Guizot, as stated in some Journals.

vascular or nervous network—but exclusively in the digestive organs, and especially in the pharynx and stomach. The cough and convulsive movements of the larynx are excited by a pruriginous irritation of the pharynx; which, again, probably depends on some special affection of the stomach."

SURGERY.

RETENTION OF URINE IN THE BLADDER RELIEVED WITHOUT CATHETERISM —A METHOD OF TREATMENT PROPOSED BY MR. J. J. CAZENAVE OF PARIS.

In the *Union Médicale* for 19th July 1849, Mr. J. J. Cazenave adverts to the great difficulty which is frequently encountered in relieving, by means of the catheter, persons suffering from retention of urine in the bladder, and describes a method of treatment, which he performed and found more available than the instrumental. During the last eleven months he has been called to eleven cases of this description: *three* were from chronic inflammation of the prostate gland, and the other *eight* were dependent on strictures. Of the latter class, three had been subjected to long and unavailing trials with the catheter: and five had not been interfered with in any way. The treatment to be described completely failed in the three prostatic cases: it likewise failed in two of those in whom the catheter had been used before Mr. J. J. C. was called in: but in the six remaining cases—cases of complete retention of urine—it was entirely successful. These are the facts upon which the recommendation of the treatment is based, which is thus described by the author: "When called to a patient labouring under complete or incomplete retention of urine, I immediately cause the large bowel to be emptied by means of an oily clyster: or I may prescribe a purgative one, if there have been no motion for fifteen or eighteen hours. When the first clyster has been returned, I make use of another, less in bulk, and of cold water. Absolute rest in bed is enjoined: and compresses soaked in cold water, or (what is better) bladders filled with roughly-pounded ice, are placed around the penis, upon the perinæum, thighs, anus, and hypogastrium. If the patient do not pass more or less water after half an hour of this treatment, I have him laid on the edge of the bed with a waterproof cloth under him, and then subject him, for twenty or twenty-five minutes, to a cold ascending douche, in a small continuous stream. At the end of this time, I give another cold lavement, and introduce into the rectum small, smooth fragments of ice. The application of refrigerants to the parts above specified is, at the same time, continued. In an hour, I have generally been rewarded by success." The author speaks with disappointment of his trials with chloroformization as an aid to catheterism: for our own part, we are inclined to think that in many cases it may be useful. However, the refrigerant method of Mr. J. J. C., we also think, is very likely to be available in a certain number of cases.

EXCISION OF THE HEAD OF THE FEMUR: CONFLICTING OPINIONS.

In our Number for February, p. 195, we noticed a diversity of opinion among eminent surgeons, as to the propriety of excising the head of the thigh-bone. Much ink has, since that date, been shed, by many writers, for and against the operation: but the question, nevertheless, remains very much where we left it; and we cannot now more accurately express our present opinion, than by quoting the words formerly employed:—"It is true, that there are great difficulties connected with the selection of cases; but it is equally true, from the results obtained by Mr. Fergusson and others, that it may, in certain instances of Hip-disease, be undertaken with great propriety; that life may be saved, and a limb, more or less useful, preserved." By the controversy which has arisen, it has been very clearly shown, that the number of cases in which this operation is a proper one, are extremely few in

number, and the recognition of them is beset with doubts and difficulties: yet we cannot concur in the *absolute* veto which Mr. Syme desires to place on the operation. The words in which he characterizes it in his latest essay are as follows,—"a proceeding which I believe to be, without exception, wholly unnecessary, utterly useless, and dangerous in the extreme." The opinions of Mr. Fergusson and Mr. H. Smith, as latterly enunciated, are so guarded, that it seems remarkable that so keen a controversy should have arisen. The practical difference is, after all, not very great. Mr. Fergusson, in his admirable clinical lecture (*Lancet*, 7th April 1849, p. 359) says,—"I advocate the practice as applicable to certain cases only, and these cases seem to me so few in number, that years may be passed in active practice, ere such an instance may come under the surgeon's notice; but when such are met with, I conceive that the principles on which we treat caries, where there seems no disposition to a spontaneous cure, are as eligibly applicable here as in all other parts of the body, where we are in the habit of cutting away carious bone."

The following is a list of the more important recent papers on the subject. All of them will repay perusal.

1. Fergusson, Wm., Esq., Clinical Lecture, in which the subject is discussed in all its bearings. *Lancet*, 7th April, 1849; also in *Medical Times* of same date.
2. Syme, James, Esq., Notes from a Clinical Lecture on Morbus Coxarius, *Medical Times*, 30th December, 1848, p. 199. Essay on Morbus Coxarius—terse and practical—in *Lancet* of 10th March, 1849. Definition of Caries, *Lancet*, 5th May 1849, p. 489. Remarks on Objections to the Definition, *Lancet*, 9th June, 1849, p. 625.
3. Smith, Henry, Esq., On Excision of the head of the Femur, *Lancet*, vol. i, 1840, pp. 361 and 413. Vol. ii, pp. 579 and 636. Strictures on Mr. Syme's opinions, *Lancet*, 6th January, 1849, p. 21; also, 17th March, p. 299. On Mr. B. Norman's opinions; also, May 5, p. 490, June 2nd, p. 597; on Mr. Syme's Definition of Caries, 12th May, p. 516. On the Surgical and Personal Points of the Discussion, *Medical Times*, 16th June, 1849, p. 647.
4. Norman, H. Burford, Esq. Morbus Coxarius and Excision of the Head of the Femur, *Lancet*, 8th July, 1848, and 28th April, 1849, p. 447.
5. Walton, H. H., Esq. Excision of Head of Femur, *Medical Times*, 31st March, 1849, p. 433.

NITRATE OF SILVER IN QUINSY.

We had imagined that the remarkable control which the application of a strong solution of nitrate of silver exerts over inflammation of the mouth and fauces, etc., was familiar to every practitioner. It is, therefore, with much surprise that we have seen in the *Medical Times* for July 21, a communication from Mr. J. D. Brown, of Haverfordwest, extolling the virtues of nitrate of silver in quinsy, and speaking of it as a novelty. He says,—"It is now five years since I adopted my present mode of treatment, and with unerring success. It is simply to apply a strong solution of nitrate of silver—forty grains to the ounce—by means of a large camel-hair brush, taking care to touch every part of the inflamed surface. This I repeat every eight or twelve hours, seldom having occasion for more than two applications; an aperient had better be given at the same time." We quite concur in the excellence of Mr. J. D. Brown's practice; but we cannot see the propriety of the following paragraph, with which he concludes his communication. "I am induced", says he, "to give this never-failing remedy additional publicity. I say *additional*, because Dr. Corfe has already spoken so highly of it, in his invaluable *Portraits of Diseases*, as having been first used in the Middlesex Hospital by Dr. Hawkins, in whose hands it has always been successful. I do not publish the result of my practice with any idea of claiming priority; I

know not how long Dr. Hawkins has used it." We would refer Mr. Brown to page 47 of vol. IV of the *Library of Medicine*, published in 1840, where the following words occur, in the article "Angina", by Dr. Symonds, of Bristol. "Of all the local remedies, there is none that can equal the nitrate of silver in applicability to all the varieties and periods of the disease." Dr. Symonds recommends it also in stomatitis; and he thus speaks of its use in *angina membranacea*: "The local treatment is, to say the least, of equal importance with the general. Caustic applications are the most successful: Bretonneau strongly recommends the undiluted muriatic acid, applied by means of a sponge; but we have a far more manageable, if not more efficacious, remedy in the nitrate of silver, which may be applied in substance, or in a strong solution." On referring to *Pereira*, 2nd edition, 1842, Mr. Brown will find that the nitrate of silver is recommended in inflammatory affections of the mouth and fauces. It was, we may add, long ago recommended by Guersent, Gendron, and Toirac. They all state that early cauterization with the nitrate of silver arrests a quinsy. Gendron used it in 1825. (Vide *Journ. de Méd. et de Chirurgie Prat.* 1834, t. v, p. 16.) It is surely not too much, to expect authors to consult one or two of the more recent standard works, to see whether their communications be really called for or not; or whether the results of their experience had not better be given as confirmatory of the views of their predecessors, than as original announcements.

PSYCHOLOGY.

DR. FORBES WINSLOW ON SOFTENING OF THE BRAIN.

Dr. Forbes Winslow has published, as a separately paged Monograph, in his *Psychological Journal* for July, an interesting and instructive paper on SOFTENING OF THE BRAIN, which he read before the Brighton Medical Society, on the 4th of January last. Circumscribed headache, Dr. Winslow regards as one of the earliest symptoms of the insidious malady which, in its early stages, is often overlooked or misunderstood. "In three cases," says Dr. W., "which came under my notice, the only symptom of any importance (which existed for four years before the disease became fully developed), was an intermittent pain, severe in its character, in the posterior part of the head." When the nature of the malady is early discerned, and energetic treatment adopted, Dr. Winslow believes that, in the majority of cases, a cure may be effected: "The great, the primary remedy, is REST FOR THE BRAIN; and, as a sequence, REST FOR THE MIND. Unless this condition be imperatively complied with, nothing—literally, nothing—can be done. The medical treatment consists in a judicious adoption of those means which are calculated to restore a fibrinous or plastic state of the blood, and to promote its healthy circulation in the brain. The patient should live generously, and the digestive functions should be improved by the exhibition of gentle alteratives, tonics, and stimulants. After ramollissement has taken place, these remedies act by determining the blood to a portion of the brain where a defective supply exists; and, as it has been suggested, may act beneficially by causing the production of fibrine and cell-germs from the albumen of the blood. In non-inflammatory softenings, *rubefacients* must be applied, and the shower-bath used. The tonics found most beneficial, have been *zinc*, *iron*, *quinine*, and the vegetable acids. The patient will derive an advantage from the use of chalybeate aperient mineral waters. Small doses of phosphorus, perseveringly exhibited, have been found advantageous; I have, in some cases, given the nitrate of silver with benefit. A careful avoidance of mental excitement, and removing the individual from the scene of business, should be strictly enjoined,—the patient carefully abstaining from all excesses, paying particular attention to dietetic rules, refraining from the use of wine, spirits, coffee, and spices." (pp. 30-31.)

REPORTS OF SOCIETIES AND ACADEMIES.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

Fifteenth Meeting of Session 1848-49. June 26, 1849.
Dr. Addison, President, in the Chair.

Wound of the Radial Artery: Consecutive Hæmorrhage: Ligature of the Brachial Artery. By H. B. Norman, Esq. J. H., aged 13, thrust his hand through a pane of glass on March 4, 1848, and inflicted an irregular wound across the fore part of the arm, about an inch above the wrist. At the dispensary, a compress was secured by a roller passed tightly round the limb, the profuse bleeding having been previously arrested by some temporary measures. The arm became tense and painful in the evening, and the bandage was re-adjusted less tightly. After the lapse of a fortnight, the wound having partly healed, bleeding recurred On March 26, he lost blood till he fainted. On April 1, a third bleeding took place; and on the following day, the hæmorrhage returning, the author was requested to see the patient, and found the lower part of the fore-arm swollen, tense, and hot; a sloughy opening marked the spot whence the blood had issued, and the surrounding parts were "boggy". Compresses were re-applied above and below the wound, in the course of the radial artery, and secured by a lightly-rolled bandage. The constitutional disturbance was augmented on the following day; the integuments about the wound sloughed, giving exit to bloody pus, and strong pulsations were distinctly felt over this part of the limb. The inflamed tissues were now freely divided, a poultice was applied, and a compress placed over the brachial artery. On the 4th, a further hæmorrhage determined the author to apply a ligature on the brachial artery. The constitutional disturbance continued for some time, but ultimately subsided; the lower wound assuming a healthier appearance. The ligature came away on the eighth day, when both wounds were healing, and on May 2, were closed.

The author regrets the wounded artery was not exposed in the first instance, and its bleeding ends secured by ligatures. He admits that compression may sometimes be effective where it is immediately resorted to, and great care exercised in its employment: of such practice being successful, he cites an instance. He considers the adoption of similar practice to that first referred to (viz., ligature at the seat of injury) in secondary hæmorrhage, a more open question; and observes that, in the case just narrated, the means seem to have been justified by the end, the circulation in both ulnar and radial arteries being arrested, and only restored subsequently in that part of the latter artery which was below the seat of injury. After the application of the ligature, the temperature of the afflicted limb was 2° Fahr. below that of the opposite, on several occasions when the comparison was made.

Case of Diseased Larynx, in which Tracheotomy was three times performed, and a portion of Necrosed Ossified Cartilage was coughed up from the Bronchus, through the Artificial Opening. By E. Humby, Esq., M.R.C.S. T. H., aged 53, passed the greater part of his life at sea, or in the West Indies. In April 1845, having had syphilis two years previously, he took mercury to relieve secondary pains. In July, severe catarrh was accompanied by pains, sore throat, loss of voice, and dyspnœa. Active antiphlogistic treatment proving unavailing in relieving the last symptom, tracheotomy was performed, and a silver tube worn for a month This was then dispensed with for three weeks, but the recurrence of dyspnœa required its re-introduction. Mercury was then rubbed in; the patient was kept in a room supplied with a constant jet of steam, and iodine was given internally. In July 1846, the difficulty of breathing increasing, it was determined that the

opening should be enlarged, and a wider tube introduced. This was effected, with difficulty, by Mr. Liston, in consequence of ossification of the rings of the trachea, which the bone forceps were required to divide. In October following, Mr. Humby first saw the patient. He was then suffering from constant cough, muco-purulent expectoration, great constitutional excitement, with physical signs of mischief in the lungs. On November 14, Mr. Liston cut out a second piece of ossified trachea; and, in a fit of coughing which followed, a large piece of necrosed ossified cartilage (apparently a part of the cricoid) was coughed up. The patient died six days after this operation. — *Autopsy.* The right pleural cavity contained three pints of turbid serum, with lymph. The left lung was partially consolidated. The upper part of the larynx was nearly closed; the back of the cricoid cartilage was absent; the rings of the trachea were ossified; and in the left bronchus was a fragment of necrosed ossified cartilage. The principal points of interest in the case are, the great difficulty attending the operation, and the ejection of the dead bone from the bronchus.

Minute Anatomy of the Sudoriferous Organs. By G. Rainey, Esq., Demonstrator of Anatomy in St. Thomas's Hospital. The epidermis is composed of a superficial and a deep layer; the former consisting entirely of epidermic scales, the latter being made up of epidermic cells, excepting where perforated by the sudoriferous ducts. These layers are distinguishable from one another by the dark colour of the deeper layer appearing to present an undulating border. The fact of the cells being in one layer, and the scales in another, is contrary to the opinion generally entertained, that the epidermic cells become progressively changed into epidermic scales, as they approach the surface. It renders the explanation of the cause of the spiral course of the sudoriferous ducts more simple; for, as in this layer, the epidermic scales undergo no change in their structure, and but very little in their dimensions; the duct, being built up of these scales, must remain the same through the entire thickness of this layer, as when it first entered it. In the superficial layer, the sudoriferous ducts are composed of epidermic scales, so placed, that the long diameter of each is parallel with the axis of that part of the passage into which it enters. This part of a duct is destitute of membranous parietes, being merely a passage between epidermic scales. In the deep layer of the epidermis, the sudoriferous ducts are situated above, between flattened epidermic scales, with their long axis placed as before observed; and below, between epidermic cells in different states of development. Now, as some of the lowest of these cells are so imperfectly formed, as scarcely to have the character of cells, it must follow, that the part of the passage which is situated between such cells, cannot have its parietes well defined; and there must be a part in every duct (where the cells forming it are just coming into existence) so imperfect, that the sweat in entering it will pass through little more than a layer of blastema; it is for this reason, that the most inferior part of a sudoriferous duct becomes so indistinct, that its termination in the dermic portion cannot be distinctly made out; and it is in this respect that all the delineations of these ducts, which I have seen, are incorrect, and convey an erroneous idea of their exact structure. The parietes of these ducts are erroneously represented, as passing continuously from the dermis into the epidermis; the tube at this part being made to have the same diameter as elsewhere, whilst the fact is, that the lower portion of the epidermic part is conical, and narrowest below, being shaped like the end of a cork-screw, and the upper part of the dermic portion of the duct is rather conical also, but its base is above. The part of a duct, which is situated between the cutaneous papillæ, contrary to what is generally stated, is, in the place of being straight, very much curved, this being the part in which it gets its spiral form. The dermic portion of the duct is continued from the gland in a flexuous course to the dermic, where it terminates, by the membrane of

which it is formed, becoming continuous with the basement membrane of the papillæ. It is lined by a layer of epidermic cells, which get gradually indistinct towards the gland. Respecting the spiral and conical form of the sudoriferous ducts, it is observed, that this can only be acquired in the deep layer of the epidermis; since, in the superficial layer, the scales of which they are built up, undergo little or no change after they have once been protruded into it, and the dermic portion of the ducts is totally of a different structure to the epidermic. The form which the ducts take in this layer, is attributed to the changes which the cells here undergo during their transformation from mere nuclei into perfect cells, and their subsequent conversion into scales, these changes being confined entirely to the deep layer of the epidermis. The ducts here become conical, by the cells which bound them becoming more and more flattened vertically, in proportion as they become pressed upwards, the space between them gradually increasing, as they acquire the form of scales. Besides, this part of a duct is situated in a conical space between the papillæ, where, at its inferior part, the epidermic cells are much more crowded together than at its upper part. This relative difference between the number of cells, and the space containing them, would allow of their being more easily separated above than below, by the secretion passing between them. Respecting the spiral form, the increase in the dimensions of the epidermic cells during their growth from nuclei to perfect cells, and their subsequent flattening and conversion into epidermic scales, would have a tendency so to alter the thickness of this stratum of the epidermis, as to throw the passages between its cells, into a more or less zig-zag form. The changes which take place during the formation of cuticle, as well as during that of other structures, do not proceed with perfect uniformity, but are doubtless more active at one period, or in one state of the system, than at another. It is probable that the laminated form of the nails, the concentric osseous layers around the Haversian canals, and the length of the coils of the sudoriferous ducts, are the results of certain alternations of activity and repose of the processes by which they are formed. As there are no other glands in the skin of the hands and feet, I consider the sweat glands as those which furnish the oily or sebaceous matter with which these parts are anointed; and, in place of considering the sweat as an increase of the vapour which is at all times given off, as the insensible perspiration, regard it as an increased secretion of these glands. These are, in their less active state, sebaceous, and in their more active one, sweat glands. The vapour which is exhaled at all times from the skin, whilst in its normal state, is the fluid in which the solid material of the cuticle was dissolved, in order that it might be in a fit state to pass through the coats of the capillaries, having become separated from the solid component of the epidermic blastema, during the production of epidermic cells, and having penetrated the scaly layer of the cuticle, so as to arrive at the surface. In a minute state of division, the fluid part of the sebaceous secretion would doubtless form a part of this vapour.

Treatment of Pericarditis; especially on the effects of Bloodletting and Mercury. By John Taylor, M.D., Physician to the Huddersfield Infirmary. The author analysed, in respect to treatment, the forty cases of pericarditis, published in the *Lancet*, in 1845, and 1846. They are divided into—1. Those occurring in connexion with acute rheumatism, the subjects of which were previously in good health; and 2. Those occurring in connexion with renal disease, or in persons in a previously bad state of health. The patients in the first class, besides being in good health, were younger, and suffered from much fewer complications than those in the second class. Very few of those in the first class died, whereas all died in the second class. The conclusion is, that age, previous health, and the nature of complicating diseases, have more influence than treatment upon the termination of pericarditis.

The remedies, whose effects are examined, are chiefly Blood-letting and Mercury:—I. Blood-letting. The conclusions arrived at are the following:—1. The duration of pericarditis increases, in proportion as the time is longer, between the commencement of the disease and the first bleeding. 2. The duration of the cases bled after the first four days, is greater by one-half than that of those bled within the first four days from the invasion of the disease. 3. The influence of bleeding was more marked in the cases in which it was copiously and repeatedly, as well as early, practised, than in those in which blood was drawn less frequently and more sparingly. 4 Pericarditis is never extinguished at once, by bleeding, however early, or however copiously practised. 5. In several cases, the pericarditis was suspended for a limited time. The suspension, in every instance, was immediately consequent upon the local abstraction of blood. 6. It is probable, that renal has a longer duration than rheumatic pericarditis. 7. Blood-letting must be less copious, and is more frequently inadmissible, in renal, than in rheumatic pericarditis. 8. Blood-letting probably lessens the mortality, inasmuch as it lessens the duration of pericarditis; but direct proof of the reduction of mortality, is not to be obtained from these cases. 9. The abstraction of blood by venesection, cupping, or leeches, almost invariably relieved the pain at once, but not permanently. There is no reason to believe that any one form of bleeding relieved pain more effectually than another. 10. Blood-letting never lessened the frequency of the pulse, except when there were signs of the inflammation having abated. 11. The tendency to syncope, in some cases of pericarditis, renders it necessary to be very careful in abstracting blood by venesection. 12. Free venesection for pericarditis, does not always prevent the subsequent appearance of serous inflammation in other internal organs.

II. Mercury. 1. The cases in which mercury was given within the first four days, had an average duration, less by five days, than those in which it was given later. 2. The cases in which salivation was produced within the first four days, had an average duration, less by two days, than those in which it occurred later. 3. It is difficult to determine how much of the benefit was due to the mercury, because all the patients who took mercury were likewise bled; and, in almost every instance, the two remedies were first employed on the same day. 4. The author is inclined to the conclusion, that the benefit was due, in a greater measure, to the bleeding than to the mercury; partly because the duration of the disease was more abbreviated in those who simply began to take mercury, than in those in whom salivation was produced within the first four days. The administration of mercury coincided with the bleeding, but the salivation did not; and the results are just what might be looked for upon the supposition that the benefit was due to the bleeding, and not to the mercury. 5. If the production of salivation had anything like the marked influence in arresting inflammation, and promoting the removal of its products, which it is currently believed to possess, the duration of the cases of pericarditis, after salivation, ought to have been much less than it really was. This is proved by a detail of the cases. (a) Salivation was not followed by any speedy abatement of pericarditis in sixteen cases. (b) Salivation was followed by pericarditis in five cases. (c) Salivation was followed by an increase in the extent and intensity of the pericarditis, in three cases. (d) Friction sound ceased two days before the mouth became sore in two cases. (e) Salivation was followed by a speedy *diminution* of the friction sound in two cases; it did not *cease*, however, for some days after. (f) The pericarditis *ceased* soon after salivation in two cases. In one of them, however, it had been declining for some days before. (g) Mercury was given, but no salivation was produced in seven cases. (h) No mercury was given, nor other treatment adopted in eight cases. (i) Cases are detailed, exhibiting the occurrence of various internal inflammations, during the time that salivation was proceeding. The cases comprise examples of endocarditis, pleuro-pneumonia, pneumonia, pleuritis, erysipelas, and rheumatism.

CHRONIC HICCUP AND VOMITING: DISCOVERY OF OXALIC ACID IN THE BLOOD. By ALFRED BARING GARROD, M.D., Assistant-Physician to University College Hospital. A report of this paper appeared at p. 690 of our last number.

CASE OF CALCULI OF THE PANCREAS, ONE OF WHICH ESCAPED INTO THE ABDOMEN, CAUSING DEATH BY INTERNAL HÆMORRHAGE. By OSCAR M. P. CLAYTON. J. R., aged 47, an inspector of police, eighteen months before his death, consulted the author, relative to frequently recurring dyspeptic symptoms, and a deep-seated pain at the epigastrium. Two or three months later, during an unusually severe paroxysm of pain, hæmatemesis to a considerable amount occurred. The attacks of pain recurred at intervals of two or three weeks, and when severe, were followed by more or less of hæmatemesis. Emaciation at the same time slowly increased. His death was attended by symptoms denoting some lesion, probably hæmorrhage within the abdomen.

On examination of the body twenty-four hours after death, coagulated blood, in large quantity, was found in the peritoneal cavity. The liver and alimentary canal were healthy. But the pancreas was much enlarged, and contained numerous calculi lodged in the dilated trunk and ramifications of the excretory duct. The duct itself presented an opening, through which the largest calculus had escaped into the cavity of the abdomen. This calculus, two-thirds of an inch in length, consisted of carbonate of lime, with traces of phosphate of lime, animal matter, and fat.

HEMIPLEGIA, ASSOCIATED WITH GREAT HYPERTROPHY OF THE HEART, TERMINATING BY RUPTURE OF THE AORTA, AND DISSECTING ANEURISM. By JAMES R. BENNETT, M.D., Assistant-Physician to St. Thomas's Hospital. A shoemaker, aged 52, was admitted into St. Thomas's Hospital on the 27th of February 1849. His habits had been temperate, and previous health good till within five or six months, since which time he had suffered from palpitation, vertigo, and headache. Fourteen days before his admision, he had hemiplegia. On his entrance he was still hemiplegic. There was evidence of a greatly enlarged heart; but of no obstruction to the circulation, either pulmonic or systemic. There was a slight diastolic bruit heard just below, and to the right of the left nipple, and there only. His general condition varied from time to time till the 21st of April, when the paralytic symptoms became suddenly aggravated. On the 24th of April he suddenly uttered a cry, indicated that he had pain in the chest, and in three or four minutes expired. Examination *post mortem* revealed an apoplectic clot in the left corpus striatum, surrounded by much softening of the brain, and a similar clot in the centre of the pons Varolii, surrounded by white softening. All the arteries at the base of the brain, and the smaller branches given off from them, were loaded with atheromatous deposits. In the left pleural cavity, there was between three and four pints of recently coagulated blood, which had escaped through a laceration in the costal pleura. This opening was surrounded by extensive extravasation of blood beneath the pleura, and the cellular tissue in the posterior mediastinum was throughout infiltrated with blood. On laying open the aorta *in situ*, there was found a transverse rupture three-quarters of an inch in length, immediately beneath the origin of the subclavian artery. Above the point of rupture, the arterial coats were not separated for more than a line or two in extent; but from this point downwards, as far as the iliacs, the artery was split up by the blood which had been forced along between the fibres of the middle coat. The aorta and its main branches were studded with atheromatous deposits. The heart was enormously enlarged. With the exception of a trifling opacity, all the valves and the endocardial membrane were healthy. The coronary arteries were healthy. In structure, both lungs and the pleura were healthy. The kidneys were pale and mottled.

The author considered the general arterial disease as the origin of all the subsequent structural changes in the heart and brain. The patient appeared

never to have had any arthritic disease, and there was nothing to indicate that the heart or pericardium had ever been the seat of acute or chronic inflammation. The hypertrophy of the heart was therefore referred to the loss of elasticity of the aorta, etc.; but the aortic valves might, in consequence of the force to which they were subjected, have allowed some regurgitation, and the existence of a diastolic bruit favoured such a view. The augmented nutrition of the heart, and the healthy state of the coronary arteries, were contrasted with the condition of the brain and its diseased arteries.

The President (Dr. Addison): It is a question how far the diastolic bruit was indicative of aneurism. To me it appears strongly indicative of it, being below the nipple. A very short time ago I saw an instance of it. The aneurism was seated behind the heart. But I doubt its being the result of injury to the valves.

Dr. Theophilus Thompson: One point of value connected with the paper is, that it is an illustration of Dissecting Aneurism taking place, in the absence of those causes which generally give rise to it. There was no decided rheumatic affection, or affection of the aorta. The loss of elasticity of the middle coat of the aorta is dependent generally on inflammation; but here there were no symptoms of inflammation about the aorta. Again, there was no rheumatism. On what did it depend? I think we may assume, that it arose from premature old age of that particular membrane. The appearances are very similar to those presented in old age; and in the absence of any symptoms of inflammation, and the presence of symptoms of senile degeneracy. It is most evident that the changes in the brain took place before the laceration of the coats of the artery; but this deficiency was favourable to the softening of the brain. I would remind the Society of the case of Moret, a physician, brought forcibly before my mind by the paper read. There was considerable softening of the brain, and paralytic symptoms, which subsided, and ultimately issued fatally, accompanied with rupture of the aorta, and the escape of pints of blood into the pleural sac. It was thought that disorganisation of the brain occurs by the effusion of blood between the two layers of the middle coat of the artery. Indeed, there was reason to think that this condition had existed for some days; and certainly this case seems to favour the opinion, that a condition of artery leading to laceration may often occasion softening of the brain and clots,—that the paralytic symptoms may subside, and that the cause of it is preliminary disease of the artery.

Dr. C. J. B. Williams differed from the opinion of the President, that a diastolic murmur could be produced by aneurism without interference with the aortic or pulmonary valves. He (Dr. W.) had met with instances in which regurgitant aortic murmurs were heard in greatest intensity at various spots between the left nipple and mid-sternum—their loudness depending, as he had long ago shown, on the proximity of the left ventricle to the anterior wall of the chest, which varied much with the enlargements and displacements commonly occurring in extensive disease of the heart. The atheromatous thickening of arteries was now generally understood to be of the nature of fatty degeneration, which, although apt to occur in the products of inflammation, and therefore being occasionally a sequel of arteritis, yet might take place as a perversion or degradation of ordinary nutrition in cachectic states, like other instances of fatty degeneration.

Dr. Peacock inquired whether the competency of the aortic valves had been tested by the action of a column of water, before the orifice was divided? If not, it was difficult to decide whether there was, or was not, regurgitation. [Dr. J. R. Bennett said, the experiment had not been performed.] Though considerable general hypertrophy of the heart was frequently seen without any material valvular disease, he thought such an extreme amount of hypertrophy and dilatation of the left ventricle, as existed in this instance, rarely occurred, unless there had been regurgitation through the aortic orifice. The murmur

heard during life supported the view that the valves had not been entirely competent. By far the largest proportion of cases of dissecting aneurism were similar in their result to that of Dr. Bennett,—the internal causation which led to the formation of the aneurism, being generally followed, in a very short time, by rupture of the external wall of the sac. Four or five cases were on record, in which the internal rupture had a similar situation to that in the present instance; and there was also another case, in which the sac burst into the left pleural cavity. In Dr. Bennett's case, the rupture of the vessels in the brain was antecedent to the formation of the dissecting aneurism; but, in some cases, the sudden obstruction to the flow of blood caused by the aneurism, occasioned a second rupture of some other part of the vessel. This occurred in two cases which fell under his (Dr. P.'s) notice; and in several on record, the cavities of the heart had given way from the same cause. The case confirmed an opinion which he had before expressed, that the sac of the dissecting aneurism would probably always be found in the laminæ of the middle coat of the artery, and not between the middle and external coat. He had found, by experiment, that the external coat alone does not possess sufficient density to retain a column of fluid injected between it and the middle coat. In five or six cases which he had examined, in the recent state, he found the sac situated between the laminæ of the middle coat; and in two cases which he had had the opportunity of carefully dissecting (and which had been previously described as cases of dissecting aneurism, in which the sac was situated between the middle and external coat), he had found that a distinct layer of the middle coat had been separated with the external coat, forming the outer wall of the sac; so that the aneurism was really situated between the laminæ of the middle coat.[1]

Dr. Black thought that the author of the paper had submitted to their consideration, with much succinctness and ability, the most important points which the case involved. There was one point of much interest, in a physiological point of view (and not unimportant in its practical bearings), on which no observations had been addressed to the chair, and which, though distantly alluded to by the author, had not engaged that attention to which, from its importance, it was entitled. The case was one in which, from the amount of disease, little could be expected from remedial measures; at the same time he thought that that part of the treatment which had reference to the heart was, perhaps, in some degree misdirected. The condition of this organ, though enlarged in a great degree, and vastly hypertrophied, may certainly be considered a disease *per se*, yet it could not operate as such in the particular circumstances of this case; and the proof of this opinion is to be found in the fact, that the patient's health was good, and his circulation unembarrassed,—as far, at least, as his own feelings were concerned, or appearances indicated,—up to the time at which he became the subject of a paralytic seizure. Doubtless, in this case, the ossification of the arterial system, and the heart's hypertrophy, must have existed for a very long time; they had gone on, in some degree, *pari passu*, though the one must be considered consequent on, and rendered necessary by, the other. The phenomena illustrate the relation (unobscured by valvular disease) between hypertrophy of the heart, and general rigidity of the arterial system. Indeed, without this sequence, or pathological relation, it would be impossible that life should be prolonged; and this result becomes manifest from a moment's consideration of the powers by which the circulation is maintained. If the spring which has to be acted on, loses its elasticity, a greater force must be called into action, or the effects which depend on its reaction will cease. We are apt to be misled in such cases, if we direct our treatment to that which, in the particular circumstances, cannot operate injuriously, but must rather be considered necessary and advantageous.

[1] Dr. Peacock's Researches on Dissecting Aneurism were published in the *Edinburgh Monthly Journal* for October 1843, p. 871.

Dr. J. R. Bennett, in reply, doubted whether there was anything in the artery that could be called an aneurismal sac; but there were, undoubtedly, various depressions arising from the irregularities produced by the extensive deposits of atheroma, and it was possible the bruit might be produced by the passage of the blood along an artery whose surface was thus unequal. He admitted the question to be important,—as, *e.g.*, in reference to Dr. Black's view of its being undesirable to interfere much with the over-action of the heart, if this was the result, and the desirable result, of impaired elasticity of the artery. If the bruit was not held to be diagnostic of disease of the artery, there was nothing to lead to the conclusion, during life, that the hypertrophy of the heart was the necessary and salutary consequence of the state of the artery, and therefore not to be much interfered with.

After a short address from the President, referring to the great prosperity of the Society, the next meeting was appointed to be held in November.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

Ninth Meeting of Session 1848-9. April 4, 1849.

James Syme, Esq., President, in the Chair.

Survival after Shipwreck, Starvation, and Fatigue. By Dr. Robert Paterson. The schooner Jacky, of Leith, with the captain, six men, and a boy on board, left Galatz on the 24th July 1848. Before sailing, the whole crew had suffered from ague; and when the vessel reached Constantinople, on the 20th August, two men were left behind, and two fresh hands substituted. During the homeward voyage, the weather was bad, and the winds contrary; and on the 27th October, while approaching the British Channel, a sea fell on board, and almost sunk her. She now became leaky, and the corn, with which she was laden, choked the pumps; half the men were sick, and all but the captain manifested singular apathy in contemplating the fate which awaited them. Some efforts were made to keep the leak under, by baling out the water in buckets. On the 28th, two of the crew were rescued by a Dutch vessel, and the mate was crushed to death between the vessels in a boat. Shortly afterwards, the schooner sank, and two of her crew were drowned; the survivors, consisting of the captain, the cook, and one seaman, reached the long-boat, which floated free. They had no provisions nor water on board the boat, and all three, especially the seaman, were hungry, weak with previous exertion, and labouring under ague. The weather was wet and cold, the sea was running high, and the boat required constant baling. The seaman died exhausted on the 29th. The survivors suffered at first severely from hunger, but the uneasy sensations from this cause soon passed away; their thirst was partly appeased by licking the rain-drops off the thwarts of the boat; the cook, contrary to the advice of the captain, also drank sea-water. On the evening of the 3rd November, (the sixth day of exposure in the boat), the cook died; his death was preceded by delirium. The captain had not strength to heave the body overboard; his legs became benumbed, he began to find his mind wandering—to see sights and hear sounds which he knew had no real existence; he continued to suffer from thirst, and from a pain in the right side of the chest. He had, however, sufficient resolution to abstain from tasting the sea-water, and kept the boat afloat by baling with a tin canister. On the morning of the 5th November, after fully *eight days* exposure in an open boat, without a morsel of food, and only a few rain-drops for drink, cold, wet, and exhausted, almost speechless, unable to walk, or even to stand, with hollow eyes and ghastly countenance, he was taken on board the Anne, of Poole. He was now treated in the most kind and judicious manner, and when put ashore on the 17th November, at Kingston, in Ireland, was so far recruited as to be able to write to his friends. He returned to Leith on the 22nd November,

and from this period his case has been watched by Dr. Paterson. Sloughs, which had formed on the feet, separated, and the sores healed readily; he gained flesh fast, and by the middle of December was able to go about. On the 22nd December, after exposure for some hours to a frosty air in the country, he was seized with a severe rigor, which he believed to be a return of ague. Pain in the right side soon succeeded, together with cough, rusty sputa, and feverishness. There was dulness on percussion in the lower part of the right side of the chest, and dry crepitation was audible over the surface of the right lung. These symptoms yielded to appropriate treatment; but, on the night of the 29th December, he suddenly became sensible of extreme dyspnœa, and of acute pain, stretching from the epigastrium round the right side to the spine; the dulness of right side continued. On the 31st, there was marked resonance observed on percussing the right side; the pulse was small and feeble, and respiration laborious. He died on the 9th January 1849.

On dissection, the right lung was found reduced to the size of the fist, flattened, and tied down to the spine by recent lymph. There were two pints of flaky serum, and a quantity of air, in the right sac of the pleura. At the inferior portion of the lower lobe of the lung, there was a cavity of the size of a walnut, lined with delicate blue membrane, communicating with a large bronchial tube above, directly and freely, and opening below by a small narrow slit into the cavity of the right pleura. The cavern contained a little white tenacious mucus; the tissue surrounding it was somewhat condensed; there was no appearance either of gangrene or of tubercle in any part of the lung. The precise morbid process which led to the formation of the cyst could not be determined. It was probably formed during the patient's exposure in the open boat in October; and perforation of the pleura must have taken place on the 29th December, during the apparent convalescence from pneumonia. In the latter part of his communication, Dr. Paterson instanced a number of cases in which hunger and thirst had been endured for long periods. The sensation of thirst had been mitigated in the instance of Captain Bligh and his companions, by wearing their clothes after saturating them with sea-water. In the case of the captain of the Jacky, courage and hope, which never forsook him, probably contributed to support him under protracted sufferings.

Analyses of the Blood in Cholera. By Dr. William Robertson. Dr. R. grouped the cases under four heads, described the appearance and general properties of the blood in each, and exhibited the general chemical results obtained from thirty analyses, conducted according to Andral and Gavarret's process. Five of the analyses were made by Dr. Douglas Maclagan, one by Dr. Christison, and the rest by Dr. Robertson.

AVERAGE CONSTITUTION OF 1000 PARTS OF CHOLERA BLOOD.

	Fibrine.	Org. Serous Solids	Inor. Do.	Globules.	Total Solids.	Water.	Sp. gr. of Serum.	Sp. gr. of Blood.
Early stage	2·7	82·2	7·8	103·4	196·1	803 9	1030·0	1053·7
Early collapse ..	3·2	94·0	7·0	130·8	235·0	765·0	1033·7	1059·5
Collapse	3·2	101·2	6·9	130·0	241·3	758·7	1036·6	1066·4
Reaction stage..	3·5	76·6	6·6	126·7	213·4	786·6	1030·6	1057·9

Distinct indications of the presence of urea had been obtained both by Dr. D. Maclagan and by Dr. Wm. Robertson, upon testing blood taken from the heart and veins after death; and, on one occasion, Dr. Maclagan had obtained similar indications, upon examining blood drawn from the arm during the early stage of the disease. *Urea* seemed most abundant in the blood of patients who died during the stage of reaction; 1000 grains of blood yielding in one case 1·6, in another, ·73 of nitrate of urea. The chief conclusions which these analyses, coupled with certain phenomena of the

disease, suggested, were,—1st. That anæmia, or an impoverished condition of the blood, acted as a predisposing cause of Cholera. 2ndly. That although during Cholera the relative proportion of the blood constituents was rapidly and singularly altered, there was yet no evidence that the primary operation of the morbific poison was exerted upon the circulating fluid,—the chemical changes recorded were only the *effects* of the morbid process. 3dly. That the changes which the blood underwent, up to the period of reaction, consisted in a concentration of the serum from loss of water, and a loss of salts almost proportionate to the amount of water abstracted. 4thly. That the *proportion* of salts was lower during reaction or convalescence, than during the progress of the disease. For every 1000 parts of water, there existed, during the *early stage*, 9·7, during *early collapse*, 9·2, during *collapse* 9·1, and during *reaction* only 8·4 parts of mineral constituents of the serum. That, consequently, the phenomena of the stage of collapse could not be due to the loss of salts, and that the saline treatment did not rest upon a good theoretical foundation. 5thly. That the changes observed during reaction were probably due, in part, to absorption of fluid into the circulation, and consequent dilution of the blood. This absorption sufficiently accounted for the small per-centage of inorganic serous solids during reaction, and might assist in explaining the marked diminution of the organic serous solids. 6thly. That during reaction the fibrine was often proportionately increased, and that there was reason to believe that blood-corpuscles were at the same time rapidly formed. 7thly. That the albumen, which was withdrawn from the circulation, was metamorphosed, converted into tissues, excreted by the bowels, and, in most cases, likewise excreted by the kidneys. In nearly eighty per cent. of the urines examined during convalescence, albumen was detected; its absence might accordingly be regarded as exceptional. 8thly. That the formation and retention of urea in the blood was always to be dreaded during reaction, and hence that the use of diuretic remedies, and especially of such as were believed to possess the property of expelling urea from the system, was clearly indicated. Tabular statements of the analyses were exhibited.

Dr. Christison inquired, if an experiment which he had made during the former epidemic, and which proved that the dark blood of Cholera was yet quite susceptible of arterialization, had been confirmed on this visit of the disease. He had found, that the blood when defibrinated by agitation in a phial with pieces of zinc, rapidly assumed the arterial hue when subsequently agitated with atmospheric air or with oxygen gas.

Dr. Douglas Maclagan and Dr. William Robertson had both recently confirmed the accuracy of Dr. Christison's observation.

Poisonous Food. Dr. Christison had been recently consulted in the case of a lady and three children, who, about an hour after dinner, all became suddenly and seriously ill, the chief symptoms being vomiting, with sickness and great depression. The soup, of which all had partaken at dinner, was made of hare. The cook declared that the hare, although not in season, was in good condition; but that it was an *old hare*, and had *very yellow bones*. She next day ate the remainder of the soup herself, and suffered like the other members of the family. All recovered. Dr. Christison was anxious to hear if other members of the Society had met with similar cases.

Dr. Douglas Maclagan had been four times consulted on account of somewhat similar symptoms supervening upon the use of rabbit-pie. On two occasions he had unsuccessfully applied the tests for mineral poisons, for jalap-resin, etc., to the remains of the pie. There could be no doubt that the vomiting and purging were connected with the rabbit, and not with the paste, nor with any other article consumed at the same time. In some of the instances, all who ate of rabbit suffered, while those who partook of other articles at table escaped.

Society Reports. It was then moved by Dr. Christison, seconded by Dr. Douglas Maclagan, and unanimously carried, "That the Secretaries be instructed to communicate the authenticated minutes of the Society to the editors of the *Edinburgh Monthly Journal*, and that the report of its transactions thus furnished should be the only one authorized by the Society."[1]

Tenth Meeting. Session 1848-9. April 18.

Dr. Begbie, V.P., in the Chair.

Dissections of Stumps after Amputation. Mr. Spence produced several dissections of the stumps. He first called the attention of the society to the mass of muscular tissue, which overlapped the bones in some of his preparations. The leg belonging to one of these stumps had been amputated by the flap operation, twelve years before the patient's death, and the stump was still well-formed, and covered with muscle. He was inclined to doubt, whether the atrophy was so considerable in the muscles of stumps as was generally believed. It had been stated by Mr. Hargreave, that after amputations performed during early life, the bone included in the stump continues to grow in length, and two of the bones (femora) now before the society, seemed to have acquired such increase. In the upper part of a femur, from the University Museum, there was likewise an apparent increase in length, but this was probably due, not to any fresh deposit of osseous tissue, but to the altered obliquity of the neck and shaft of the bone, consequent upon the weight of the patient's body having been, after the amputation, allowed to rest principally upon the other leg. Two preparations exhibited an elongated point of bone protruding from the surface, which had been divided by the saw; the end of the bone was *conical*, not *rounded off*, as after amputations in the adult. Mr. Spence believed, that *neuromata* were unavoidably formed, when nerves were divided,—by whatever method amputation was performed, and however deeply the nerves were covered. When a nerve was cut across, the neurilemma retracted, the nervous fibrillæ projected, and ultimately became firmly connected with lymph effused about the point of section. Some fibrillæ were spread out upon the surface of the lymph, others were imbedded and interwoven in it. The tumours thus formed were not productive of pain, unless exposed to pressure between the bone and skin; or so thinly covered, as to be affected by atmospheric influence. The size of these neuromatous tumours was not dependent upon their being more or less thickly covered, and in some of Mr. S.'s dissections, very large ones were exposed, deeply seated in the stumps. An extended investigation, by means of similar dissections, might lead to more determinate views as to the plans of operating best adapted for securing a well-formed stump.

Intestinal Concretions of Extraordinary Size, in a Young Female. (In a Letter from Dr. Ritchie, Physician to the Royal Infirmary, Glasgow.)[2] "The mass, consisting wholly of long human hair, was extracted after death from the stomach of a girl aged twenty-one, admitted into the Royal Infirmary under my care, on the 4th of October 1848. She came in with great meteoric distension of the abdomen, feculent vomiting, and the other usual symptoms of obstructed bowel: the menses were stated to have been always irregular. On the 5th, when I saw her first, I perceived some hardness to the left of the umbilicus, but the presence of the tumour in question was concealed by the great tympanitic swelling of the bowels till the 12th, two days previous to which, the constipation had been overcome, and the general distension removed. The tumour, which lay in the epigas-

[1] Our Reports are made up from our Edinburgh cotemporary and the *Medical Times*.

[2] We have slightly curtailed Dr Ritchie's letter from the *Edinburgh Monthly Journal* for July 1849.

trium, and encroached a little on both hypochondria, and which also presented a rounded convex exterior, and a well defined margin, simulated the liver so strongly, that it was mistaken for that organ, till it was seen that, on grasping it through the parietes, and pulling it downward, a considerable hollow space could be produced between its upper edge and the ensiform cartilage. Immediately on the removal of the ileus, (which happened under the steady use of half a drachm of magnesia every four hours, an enema of tepid water three or four times daily, warm fomentations to the abdomen, and a grain of opium every six, and then every eight hours), the pulse began to rise, severe diarrhœa came on, with aphthous exudations on the throat, and she died on the 24th, or twenty days from admission.

Dissection. The tumour was found to be situated in the stomach, on opening which, a mass of the precise shape of that organ was extracted. It weighed twenty one ounces, and, except at two parts, corresponding to the line of the greater curvature of the stomach, where for about an inch and a half at each part, there was an incrustation of a dirty or ash-coloured pasty substance,—it consisted exclusively of an accumulation of coils of moist female hair. The stomach, where in apposition with the incrustation on the hair, was ulcerated nearly to the peritoneal coat. The mucous lining was here and there highly injected, and throughout it, numerous elevated patches, consisting of groups of ulcerated follicular orifices, were observed. The pylorus was rather thickened : two inches to its left there was a cluster of ovoid bodies, varying in size from a dried raisin to a garden pea. The small intestines were greatly inflated—very vascular, pretty firmly glued together, and the inflammation extended over much of the omentum, mesentery, and peritoneum. The pelvis was filled with thin fæces, from a rupture in the ileum, a few inches above the cæcum. Between this lesion and the cæcum, another hairy concretion of one and a half ounces weight, and a little above the rupture a third similar mass of half an ounce in weight, were discovered. These consisted wholly of hairs of various sizes, similar to those in the stomach. The lungs were congested, and slightly emphysematous.

It was ascertained by inquiries at the girl's mother, that for many years she could not be restrained from pulling hair from her head and swallowing it, while at work as a factory weaver.

Dr. Keiller stated that he had met with a case precisely similar in Dundee. The patient, a factory-girl, was in the habit of eating tow, and the tumour found in her stomach after death resembled exceedingly that now before the Society.

Eleventh Meeting.—Wednesday, May 2, 1849.

James Syme, Esq., President, in the Chair.

Preternatural Anus. Dr. Douglas Maclagan communicated the history of a remarkable case, which is to be published.

Involuntary Grinding of the Teeth. By Dr. M. W. Taylor, of Penrith. The patient, a clergyman, eighty years of age, had for many years been subject to headaches : and of late had become imbecile, after two slight attacks of paralysis. The grinding had commenced six years ago, and of late had been almost incessant, the jaws being never at rest (except during sleep) for five consecutive minutes. The sound emanated from the left canine and incisor teeth, the enamel of which was quite rubbed away : it was heard even across a field, and strongly resembled the cry of the corn-crake. Dr. Taylor did not consider that the grinding, in his patient's case, was referable to the gouty diathesis, or to uneasy sensations in the teeth : but to disease within the cranium. From an analogous cause, it was frequently met with in hydrocephalus : when intestinal irritation from worms was accompanied with grinding of the teeth, the symptom was manifestly reflex.

Amputation at the Ankle-Joint. Dr. Richard Mackenzie read an account of a method of amputation at the ankle-joint, by single flap, which he had devised, and which had been five times performed on the living subject by himself and Dr. Douglas Maclagan.

The author recommended this operation in some cases to which Mr. Syme's method was not easily applicable, especially when the integuments on the outer side of the heel were in an unsound state, the flap being derived from the skin covering the inner and lower sides of the calcaneum, and supplied with blood by the branches of the posterior tibial artery.

Mr. Syme remarked, that it was important to know, that by this mode of operating, a better flap might in certain cases be obtained. He considered the operation difficult, and believed that the great length of the flap might render it liable to sloughing. His own mode of operation had now been followed by himself in between thirty and forty cases, and in a number of cases by other surgeons, yet he was not aware of any instance in which sloughing had been observed, attributable to violence necessary in detaching the soft parts from the calcaneum. From this cause, therefore, experience had shown that no risk was to be apprehended.

Mr. Spence and Dr. Mackenzie made some remarks upon the distribution of arteries to the soft parts of the heel. The former thought the chief vascular supply was derived from the peroneal artery, and from the outer side of the ankle: the latter contended, that the branches from the posterior tibial and on the inner side of the ankle, were fully more important.

Manufacture of Chloroform. Dr. Taylor read a communication from the Messrs. Smith, of Duke-street, upon the most economical process of preparing and purifying chloroform. They detailed, with great minuteness, the most approved modes of testing the qualities of the materials, of conducting the distillation, and of rectifying the product. They could now sell a chemically pure article for 8d. an ounce, or 10s. a pound by weight, and doubted if the pure drug could ever be produced at a less cost. It had been stated in the *Pharmaceutical Journal*, by Mr. Morson, that the best specimens of Scotch-made chloroform underwent spontaneous decomposition when exposed to light—that free chlorine and muriatic acid were evolved, and might be detected by their reactions on litmus: but a half-filled phial was exposed to the solar rays for four weeks, in Messrs. Smith's window, and even at the end of that period, the fluid had no action whatever upon litmus paper. They have noticed, that pure chloroform is decomposed by direct solar rays when the thermometer is at about 100° F., but *out* of the direct rays, the brightest sun light seems to have no effect.

Twelfth Meeting. Wednesday, May 16, 1849.

James Syme, Esq., President, in the Chair.

Congenital Extrophy of the Urinary Bladder. Dr. Mackay exhibited a child, a few weeks old, with congenital extrophy of the bladder. A sort of truss had been adapted to prevent the chafing of the clothes, and the escape of urine over the external surface of the abdomen.

Mr. Syme remarked, that an operation had been proposed, and in one case executed, for the cure of this malformation. No good was to be expected from such a procedure. The appropriate treatment consisted in applying a suitable receptacle for the urine. In one case which he had met with, the patient lived for many years in a tolerably comfortable condition, being enabled to perform the duties of a public office, to take a good deal of walking exercise, and even to ride upon horseback. He wore a silver vessel, properly secured, over the seat of the disease, to prevent the dribbling away of the urine.

Preparations Illustrative of the Course of Tubercle in the Lungs. Dr. Bennett exhibited some preparations in proof of the sanability of phthisis

pulmonalis. In one, a large deep cicatrix was seen in the upper lobe of the lung. The patient had died in the Infirmary of delirium tremens. From the account given by his friends, it appeared, that about twenty years before his death he had been affected with the ordinary symptoms of consumption, but that he was restored to health, apparently in consequence of improvement in his circumstances and habits of life. In another preparation, two stellate puckerings on the surface of the lung were found to correspond to two caverns with indurated walls, which seemed to be undergoing the process of cure. In other two preparations, numerous small gritty masses were disseminated; these were specimens of abortive miliary tubercle. These appearances were exceedingly frequent,—Dr. Bennett had met with them so often in the post-mortem examinations conducted at the Royal Infirmary, that he had stated, in a communication read several years ago before this society,[1] that evidences of tubercular disease were found in one-third or one-fourth of all who die after the age of forty.

Dr. Christison remarked, that although it had been satisfactorily shown that tubercle often underwent spontaneous cure, yet authentic examples of recovery from *confirmed* phthisis pulmonalis were exceedingly rare. The case which had furnished the preparation first exhibited by Dr. Bennett was peculiarly interesting; it was probably an instance of recovery after the formation of cavities and development of the phthisical cachexia.

Exostoses. Mr. Syme exhibited an exostosis which he had removed from a patient in the Infirmary. The most common seat of these tumours was the distal phalanx of the great toe: they were also frequently found upon the *linea aspera* of the femur, above the inner condyle. From this latter situation the tumour had been removed. In size it equalled a small orange: it was nearly spherical: consisted of bony tissue: and was coated on its outer surface with cartilage. These tumours were not malignant, and seldom caused much inconvenience; when, however, they attained such a size as that now exhibited, it was obviously expedient to remove them. It was easy to detach the tumour by the *cutting-pliers*, and the only bad consequence to be apprehended was tedious suppuration. In the present instance, notwithstanding the size of the mass removed, the wound healed readily.

Dislocation of the Humerus, with Fracture. Mr. Syme had lately met with a case of dislocation of the head of the humerus into the axilla, complicated with fracture about the middle of the humerus. This double accident was exceedingly rare. The patient had fallen through a trap door into a cellar, and his arm had become entangled among the spokes of a ladder during the fall. It was determined that the dislocation should be reduced, before an attempt was made to set the fractured bones. For this purpose the fore-arm was bent upon the humerus, and a bandage was then rolled round the whole arm as high as the shoulder. Over this a couple of Gooch's splints were placed; the lac was then attached above the seat of fracture, and secured by another bandage. Extension was made in the direction of the long axis of the trunk, a large pad being first stuffed into the axilla. Reduction was readily effected, and the subsequent progress of the case had been satisfactory.

Dislocation of the Astragalus. By Mr. Syme. The accident had occurred three months ago, in the usual way. There was no external wound, but the astragalus could be distinctly felt under the integuments of the ankle. Although there was considerable deformity of the foot, the limb was likely to be useful, and there was at present no necessity for cutting out the astragalus, as Dupuytren recommended in all such cases.

Case of Hydrophobia. By Dr. Lucas, of Dalkeith. The most interesting points in the case were thus summed up by Dr. Lucas: 1st. That eight

[1] Edinburgh Monthly Journal.

weeks elapsed between the infliction of the bite and the invasion of hydrophobia. 2nd. The wound healed, and did not subsequently become irritated. 3rd. With the exception of spasm of the respiratory muscles, no muscular effort was observed independent of volition. 4th. The physiological manifestations consisted in an intense exaltation of sensibility of the cutaneous surface, and of the reflex system of nerves. 5th. The psychological phenomena were a highly-developed antagonism between the morbid emotional and normal reflex faculties. 6th. Death took place by exhaustion consequent upon the direct and sympathetic excitement of the nervous system.

Dr. W. T. Gairdner had performed the post-mortem examination. There was some ecchymosis on the pleura, on the mucous membrane of the pharynx, and among the muscles of the neck. The right side of the heart contained a small quantity of frothy blood, and a large amount of air; and there was no evidence that this was attributable to putrefaction. Dr. G. had seen a similar collection of air in the heart of a patient who had been poisoned by carbonic acid gas. The nervous system had been most carefully examined, especially the origins and course of the eighth pair, but no evidence of inflammation or structural lesion had been detected.

Mr. Dick (of the Veterinary College) considered the hydrophobia of the human subject a disease of the imagination.

Dr. Hughes Bennett thought that the symptoms of hydrophobia clearly pointed out a lesion of the functions presided over by the eighth pair of nerves. It was true that structural lesion had not been observed in this case, either at the origin, or in the course, of the eighth pair; it must, however, be recollected, that in these excito-motory diseases, structural lesion was not essential. He quite believed that symptoms like hydrophobia might be induced by fright; a recorded case had proved that a bitten man might even die while the dog that bit him lived. There was, however, no doubt that the disease termed hydrophobia could be communicated from animals to man; and Magendie had caused a dog to die rabid, by inoculating it with saliva from a human subject suffering from hydrophobia.

Dr. Gairdner alluded to the experiments of Dr. Hartwig, of Berlin, as tolerably conclusive evidence that rabies could be communicated, at least among the lower animals, by inoculation.

Mr. Dick attached little importance to Hartwig's experiments, because, although he had laboured at the subject for five years, his inoculations only took effect in a very few cases. In similar experiments he (Mr. D.) had been uniformly unsuccessful. So convinced was he that the disease was not to be propagated in this way, that he took no extraordinary precautions in handling rabid animals, and had once allowed the saliva of a rabid dog to rest upon a sore upon his hand without any unpleasant consequences.

Dr. Christison had formed a very different estimate of the value of Hartwig's labours, which, he thought, set this controverted subject for ever at rest. Hartwig had, in five years, made fifty experiments upon the inoculation of canine rabies, using, in different experiments, different fluids, such as the blood, mucus, and saliva, of the rabid animal. In fourteen of these inoculations he had transmitted the disease from one animal to another, and had succeeded more uniformly with the saliva than with the other fluids employed. It was true that he had failed in some instances, but such failures did not invalidate the results obtained in about one-fourth of his experiments; as well might it be argued, that because vaccination sometimes failed, it was therefore impossible to communicate the vaccine virus from child to child. Dr. C. had, many years ago, in Paris, witnessed a series of experiments on the inoculation of rabies. They were performed at the Combat des Animaux, by some hospital "internes," under the direction of some able physiologists. It was found that when blood was used, the inoculation did not take effect; by far the most effectual medium was the "barve," the peculiar froth which collects about the mouth of the rabid dog. By using this fluid, the French

experimenters managed to induce the disease in several successive experiments, and, in fact, to keep up a *stock* of rabid animals for several months. It was stated by Hartwig, that dogs were subject to other diseases, resembling rabies; but there was one symptom of the true disease which was never observed in its spurious forms. He alluded to the changed character of the animal's bark,—a peculiar, checked, short, sharp, anxious howl. Hartwig, who, as head of the Veterinary College at Berlin, had immense opportunities of observation, laid great stress upon the importance of this symptom; and in the Parisian experiments, the peculiar bark of the rabid dog had been remarked both by the late Dr. Cullen and himself. He suggested to Mr. Dick, that, in some of the experiments performed in Edinburgh, and in which negative results were obtained, the animals might possibly have been affected with some of the diseases simulating rabies.

Mr. Dick proposed to repeat his experiments, and would feel glad that they should be witnessed by members of the Society. He well knew the bark of a rabid dog, described by Professor Christison, and when he heard it, he could, from it, pronounce the dog to be rabid.

The President (Mr. Syme) had, twelve years ago, occasion to treat the only case of hydrophobia which had been seen in the Royal Infirmary for forty years. A very prominent symptom was the ejection of saliva by hawking or spitting; and he presumed that the "pretty copious salivation," described by Dr. Lucas in the case of the boy at Dalkeith, was of the same description.

Thirteenth Meeting of Session 1848-9. June 6.

Professor Christison in the Chair.

Oxalic Diathesis. Dr. Begbie read an account of four cases. They showed how important it is to examine the urine in every instance of obscure disease. In three of the cases the disease had been discovered early, and recovery had followed the use of nitro-muriatic acid. In the fourth it had commenced many years before the intimate connexion of deranged health with the oxalic acid diathesis was made known, in its full extent, to the profession; and hence the true source of the patient's sufferings was not suspected, till a comparatively short period before death. This patient had placed himself under Hydropathists and Homœopathists, and those whose easy virtue permits them to adopt infinitesimal doses, when convenient, without altogether forsaking the precepts of regular practice. At last, Dr. Begbie, whose patient he had long ceased to be, suggested, through a friend, that Dr. Prout should be consulted, when the real source of his disease became apparent, and much relief was afforded. What proportion of cases falling under the term of hypochondriac disease is dependent on oxaluria, does not very clearly appear. But, in little more than four years, since the publication of Dr. Golding Bird's book on urinary deposits (in which the great frequency of the oxalic diathesis was first pointed out), enough has been observed to show that a great amount of suffering might have been saved, had the use of the microscope for the examination of the urine in obscure diseases been adopted. Every day's experience proves that it is an instrument not much less necessary for the practice of medicine, than the stethoscope.

Poisoned Pastry. Professor Christison exhibited a green powder, purchased at a confectioner's in Edinburgh, designed to colour jellies, &c., which he had found to consist of sugar mixed with verdigris and arsenite of copper. His attention had been drawn to it by the severe illness of two maid-servants, from having eaten some jelly coloured with it. Thus the fatal occurrence at Northampton, last year, from the use of the so-called emerald-green, for a similar purpose, has not yet put a stop to the monstrous practice of selling a deadly poison to ornament food.

Fourteenth Meeting of Session 1848-9. June 20.

James Syme, Esq., in the Chair.

Cholera. By Dr. W. Gairdner. His account of the *post-mortem* appearances in Cholera, included all the cases examined in the pathological theatre of the Royal Infirmary. The memoir will be found at p. 749 of this number.

In answer to questions, Dr. Gairdner stated that pulmonary diseases were rare among the cases examined, that morbid conditions of the uterine system were frequent, and that the solitary glands of the intestines were enlarged in about two-thirds of the whole number. Dr. W. Robertson and Dr. Fleming showed, by a reference to cases, that the alleged protection afforded to syphilitic patients under the influence of mercury, introduced as a question by Mr. Syme, who was in the chair, was erroneous.

Scarlatina. Dr. Newbigging read an account of the disease, as it appeared last autumn, among the children in John Watson's Institution (for children) near Edinburgh. There are a hundred boys and girls, from seven to fourteen years of age. The first case occurred in the beginning of September, and in five or six weeks twenty-five were attacked. One, a boy who had been for some time before in delicate health, died. In five, anasarca occurred, which yielded to slight treatment. The urine showed albumen by the test of heat, not merely in the dropsical cases, but *in all attacked with the fever.*

Fifteenth Meeting of Session 1848-9. July 4.

Dr. Maclagan, Senior, in the Chair.

Chronic Eczema and Impetigo. By Dr. Hughes Bennett. After noticing the frequent connexion of the acuter forms of eczema with constitutional disease, or derangement of the general health, as with strumous tendency in the young, and, in after life, with dyspeptic disorder and the oxaluric, phosphatic, or uric diathesis, he laid it down as a rule, that generally, in proportion as eczema becomes more chronic, it is the less dependent on constitutional disturbance. The form of eczema in which the simple treatment he had to recommend had been so successful, was eczema with impetigo in a chronic state, or the chronic form of what dermatologists term eczema impetiginodes. Dr. Bennett distinctly regarded this disease not as a mere form of eczema, approaching by its subsequent effects on the integuments to impetigo, without losing its vesicular character, as Bateman taught, but as a combination of the two diseases, an intermixture of the vesicles of eczema with the pustules of impetigo,—an idea which the last-named author hints at, but hardly adopts as the character of his species impetiginodes,—the truth being, that the co-existence of two or more cutaneous diseases on the surface at once is an observation which it has required time to mature. The simple treatment, found so successful, probably did not differ much from mere water-dressing. It consisted in the continued, not the mere occasional, application of a weak alkaline lotion. Two drachms of subcarbonate of soda were dissolved in a pint and a half of water, and lint wet with this lotion was kept in exact contact with the eruption, evaporation being prevented by a covering of oiled silk or gutta-percha cloth. In proof of the efficacy of this treatment, Dr. Bennett recounted several obstinate cases: one in which the disease had affected a gentleman's face at the roots of a thick black whisker; this disease had lasted for a long time, but began to yield as soon as the patient consented to the removal of the whisker, so that the lotion might be applied exactly to the seat of the eruption. In a second case the disease was seated at the roots of the beard, and this also was cured as soon as a proper mode was fallen upon of adjusting the wet lint to the part. In a third case, the disease was on the pubes and adjacent parts, and had resisted some of the ordinary modes of treatment for eight years. The cure in this last case was more tedious, owing not merely to the obstinacy of an affection

which had lasted so long, but also to the difficulty of complying with the requisite conditions of the treatment, owing to the extent and inequality of the surfaces where it had its seat. But within three months from the commencement of the treatment, the disease had entirely disappeared. Dr. Bennett attributed the cure in these cases wholly to the local treatment, though in the first the arsenical solution, in small quantity, had been employed simultaneously for a short time, and in the last the patient had gone to Harrogate, and used the waters before the complaint had altogether disappeared. In some of the cases in which the crusts were particularly thick, poultices were applied before the lotion was resorted to.

Use of the Oblique Muscles of the Eye. By Mr. Struthers. The design of the paper was to show, by considerations drawn from comparative anatomy, that the use of the oblique muscles is to produce rotation of the eye on its antero-posterior axis.

Sixteenth Meeting of Session 1848-9. July 19.

Scirrhous Induration of the Peritoneum. Dr. W. Gairdner, Pathologist to the Infirmary, exhibited a specimen of schirrhous peritoneum. The patient in the infirmary was under Dr. Alison. He was affected with jaundice of a green tint; there was pain and tumefaction on the right side; but neither of these symptoms seemed distinctly referable to the liver. At the last, fluctuation in the abdomen became perceptible. *Inspection after death.* There was a considerable quantity of blood in the abdominal cavity; the peritoneum was covered with a layer resembling inflammatory exudation, but which really was nothing more than the decolorized fibrine of a part of the extravasated blood. The peritoneum was hardened and thickened, particularly in the appendiculæ epiploicæ of the right side, in the mesentery close to the intestines, and in the omentum minus adjacent to the stomach. Minute tuberculated spots occurred in many places, in particular throughout the pelvic peritoneum. There were numerous ecchymoses in the pelvic peritoneum. There was no manifest source of the hæmorrhage, and no sign of the rupture of any considerable vessel was obtained by the injection of the aorta or of the vena cava. The mesenteric glands, though so close to one of the principal masses of the disease, were wholly unaffected, as were the liver and the other glandular organs of the body: in the peritoneum only were there marks of carcinomatous degeneration. In the tuberculated spots of the pelvic peritoneum, distinct cancerous corpuscles were discovered under the microscope. Dr. Gairdner referred to a case of soft cancerous degeneration of the peritoneum which had fallen under his observation, where, as in this instance, the mesenteric glands were unaffected, though close to the seat of the disease.

Dissecting Aneurism of the Aorta. By Dr. W. Gairdner. The patient, a man fifty-four years of age, had been given to intemperance. He had been drinking for two days, and on the third, when going to his work, he felt ill. The first symptoms, pain, &c., were referred to the stomach; and as he had suffered under a stomach complaint from early youth, his illness does not appear to have caused much alarm. When Dr. Sidy saw him, the pulse was 75, and soft; the heart's action feeble, and no bruit could be heard; there was no palpitation, nor were any indications of disease of the heart or of the great vessels gathered from the account he gave of himself. Dr. Sidy proposed to examine his chest more particularly at his next visit, but before he returned, the patient had died suddenly. On opening the body, blood was found within the pericardium in very large quantity. Both sets of valves and the heart itself were quite healthy, and no appearance of disease was found, till a large portion of the aorta was removed. On the interior surface of this vessel, a short distance from the heart, was discovered a transverse

slit, including not much less than its whole circumference; through this slit the blood had penetrated into the substance of the middle coat, between the layers of which it had made its way so as to escape through the outer coat into the pericardium, just above the right auricle. In the coats of the artery itself, there was no atheromatous, or other perceptible kind of degeneration; it seemed to be as nearly as possible in a healthy state. Dr. Gairdner, after reference to Dr. Peacock, Dr. J. Davy, and other authorities, stated it as his opinion, that dissecting aneurism of the aorta, probably originated more frequently from external violence than had hitherto been admitted. Though there was no evidence of violence in the case before the society, yet, as the man had been intoxicated for a good many hours shortly before his illness commenced, and as there was nothing in the state of the coats to account for the laceration, and more especially for its great extent, he was disposed to think that a fall, or some other kind of external force, had been concerned in the rupture of the vessel.

Connexion of Enlarged Thymus Gland with Anæmia. In illustration of the connexion between the anæmatous state and unusual size of the thymus, Dr. W. Gairdner exhibited a drawing of the neck and front of the thorax, showing a large thymus in a woman twenty years of age, from a case of an anæmatous character, which had recently occurred in the Infirmary.

Anomalous Course of the Artery of the Bulb. Mr. Spence exhibited an interesting dissection of the pelvic arteries to illustrate an undescribed anomaly of the artery of the bulb, which took such a course, that it must necessarily have fallen under the knife, during the division of the urethra in lateral lithotomy.

Bloody Cyst over the Tuberosity of the Right Ischium. Dr. James Dunsmure exhibited a cyst of considerable size, which he had recently removed from over the tuberosity of the right ischium. The contents were not unlike the fluid in hæmatocele. The man was a weaver, and the tumour had caused him so much inconvenience, that he had cut a hole in his bench to relieve it from pressure. Microscopic examination detected only the elements of the blood,—there was, however, an unusual abundance of white corpuscles.

The Society adjourned till the first week in November.

MISCELLANEOUS INTELLIGENCE.

London University. The long-expected supplementary Charter has been received. It enlarges the powers of the Senate, and contains two important provisions: one for the admission of students from all the other universities of the United Kingdom; the other enabling the Senate to institute examinations for certificates of proficiency in any separate branch of art or science, as they may see fit, without requiring the student to graduate.

New Fellows of the Royal College of Physicians. Dr. Stroud, Great Coram-street; Dr. Swaine, Upper Seymour-street; Dr. Philp, Kensington; Dr. Collier, Fitzroy-square; Dr. Wells, Reading; Dr. Shann, York; Dr. Munk, Finsbury-place; Dr. Abercrombie, Cheltenham; Dr. C. Handfield Jones, Sloane-street.

The Medical Directory. The management is henceforth to be under Mr. Churchill. We earnestly recommend every member of the profession to cooperate with him in his laudable endeavours to ensure the greatest possible amount of accuracy.

Scottish Public Health Bill. This measure has been delayed in consequence of the objections entertained, in Scotland, to some of its details.

APPOINTMENTS.

Arnott, J. M., Esq., Professor of Surgery in University College, elected Vice-President of the Royal College of Surgeons of England.

Green, Joseph Henry, Esq., Senior-Surgeon to St. Thomas's Hospital, elected President of the Royal College of Surgeons of England.

Hallett, Charles Henry, Esq., appointed Senior-Surgeon and Naturalist to the Southern Whale Fishery Company.

Mason, Frederick, Esq , appointed Surgeon to the Western Dispensary of Bath, on 27th June.

Owen, Richard, Esq., Hunterian Professor to the Royal College of Surgeons of England, elected a Corresponding Member of the Royal Academy of Sciences of Madrid, and an Honorary Fellow of the Royal College of Surgeons of Ireland.

Parkes, E. A., M.D., appointed Physician and Professor of Clinical Medicine in University College Hospital, in the room of Dr. Walshe.

Ryder, —, Esq., appointed Resident Surgeon of the Royal Kent Dispensary, Deptford.

South, John Flint, Esq., Surgeon of St. Thomas's Hospital, elected Vice-President of the Royal College of Surgeons of England.

OBITUARY.

Chapman, Sir John, F.R.C.S.Eng., aged 76, late of Windsor, on the 4th July.

Dyte, Maurice, Esq., Surgeon, of rapid consumption, in the 43rd year of his age, at 44, Houndsditch, on 12th July.

Lambert, George H., Esq., Licentiate of the Apothecary Society, aged 47, at his house, 105, Albany street, Regent's Park, on the 19th June.

Lerew, F. H., Esq., Surgeon, in the 33rd year of his age, at 54, Portman Place, Maida Hill, on the 13th July.

M'Alpin, C. C., Esq , Student of Medicine, aged 16, son of the late Rev. George M'Alpin, some time missionary in Russian Tartary, at Edinburgh, on the 26th June.

Mackellar, Dugald, M.D., formerly of Battersea, Surrey, at Funchal, Madeira, on 5th June.

Pearson, Sir William Hyde, M.D., F.R.S., aged 66, in Albemarle street, on the 10th July.

Scratchley, James, M.D., aged 65, late of the Royal Artillery, and Fellow of the Royal College of Surgeons of England, at Paris, of cholera (after a few hours' illness), on the 15th June.

Shadwell, John, M.D , Lord of the Manor of Horfield, near Bristol, aged 90, on 6th July.

Thomson, Anthony Todd, M.D., F.R.C.P., Professor of Materia Medica and Medical Jurisprudence in University College, London, at Ealing Common, on the 3rd July. An interesting memoir of this distinguished and most estimable man has appeared in a recent number of the *Medical Times*.

Thorp, Robert Disney, M.D., late of Leeds, aged 82, at the Rectory, Kemerton, the residence of his son, the Archdeacon of Bristol, on the 1st July.

BOOKS RECEIVED.

Catton (Dr.), Lectures on Phthisis. London: 1849. Clay on Ovariotomy. Manchester: 1848. Conolly (Dr. J.), Remonstrance concerning the Case of Miss Nottidge. London: 1849. Crummy, Contributions to the Practice of Medicine. London: 1849. De Jongh on Cod-liver Oil. By Carey. London: 1849. Dendy on Diseases of the Scalp. *Plates*. London: 1849. Gairdner on Gout. London: 1849. Nasmyth on the Teeth. London: 1849. Parkes' Inquiry into Causes of Cholera. London: 1849. Rees on the Treatment of Rheumatism by Lemon Juice. London: 1849. Smith on Fruits and Farinacea. Second Edition. London: 1849. Symonds' Life of J. C. Prichard, M.D., etc. London: 1849. Transactions of Provincial Medical Association, 1849.